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FOUNDED BY GEORGE CARPENTER, M.D.

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THE

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Original Articles.

SERUM PHENOMENA AND THEIR RELATIONSHIP TO THE PROGNOSIS OF DIPHTHERIA.*

By G. W. RONALDSON, M.D.Glas., D.P.H.Oxon.,

Assistant Medical Officer, Grove Hospital, London.

THE title "serum sickness" has been applied to a group of symptoms which not infrequently follows the injection of a heterogeneous serum. The first recorded observations on serum phenomena were those of Stanley in 1902; but since 1905, the year of publication of 'Die Serumkrankheit' by von Pirquet and Schick, the subject has figured largely in medical literature. Its pathology, still indefinite, continues to be investigated by the laboratory worker, but its symptomatology is now comparatively familiar to the clinician. The fact that the intensity of the serum manifestations may have an important bearing on the prognosis of diphtheria has not received the attention which it merits, and it is to the discussion of this aspect of serum disease that the present paper is directed. The significance of a well-marked serum reaction was first described in 1904 in his M.D. thesis by J. D. Rolleston. The same observer has since (1905) frequently maintained that "the more marked the antitoxin reaction, the better is the prognosis." My conclusions, based on the consideration of 1000 cases, will be found to afford additional confirmation of Rolleston's assertion. The cases studied have been under treatment in the Grove Fever Hospital, London, during the past eighteen months, but in describing symptoms and details capable of more general

* Thesis for the degree of M.D. of Glasgow University.

application, I have utilised my previous experience of serum disease as seen in other fever hospitals. The same type of serum was used in all the cases, and, unless otherwise stated, the same treatment was employed. Pathology and symptomatology are only briefly dealt with, but in discussing questions to which these are relevant, supplementary details are introduced.

Type of serum and dosage employed.—The serum employed was that in use at the various hospitals of the Metropolitan Asylums Board. It is unconcentrated, and contains approximately 300 units per c.c. Ordinary commercial serum contains about 500 units, and the serum used in Denmark about 400 units per c.c. (Bie). The percentage of reactions with our serum is high, and the reactions seen are of the most typical character. They are, therefore, of a suitable nature for the study of serum phenomena.

The cases seen recently have been of more than average severity, and included a large number of the "grave toxæmic type." The present tendency in the treatment of diphtheria is in the direction of ever-increasing doses.

Table I shows how dosage has increased in the M.A.B. hospitals during the past ten years.

TABLE I.

Year.	No. of cases.	Average number of units given to each patient.	Percentage mortality.	Percentage paralysis.
1912	6,510	14,871	6·57	9·38
1913	6,283	17,113	6·63	7·85
1914	8,101	18,240	8·47	8·76
1915	8,172	19,559	8·42	Not published.
1916	8,479	16,607	7·19	
1917	8,090	16,548	7·20	
1918	8,041	19,445	8·14	
1919	8,164	18,367	9·27	
1920	12,285	19,788	8·61	
1921	15,697	23,130	—	

The cases in this series received an average dosage of 25,200 units—a figure which will be seen to be somewhat in excess of the usual dosage in this country. They are not, however, high when compared to institutions like the Blegdamshospital, Copenhagen, where, according to Bie, 200,000 units is often exceeded. In one case I gave, with good results, no less than 180,000 units. This patient—one of a hæmorrhagic type—also received 100 c.c. anti-streptococcic serum—a procedure which,

I believe, may prove a valuable adjuvant in the treatment of certain types of cases.

All the cases were injected subcutaneously, and repeated daily dosage was the usual routine in severe cases.

Pathology.—Serum sickness is usually considered to be a manifestation of the response by the injected subject to the introduction of a foreign proteid. That the antigen is to be found in the proteins of the horse-serum seems to be beyond question, but the nature of the antibodies developed in the serum of the injected subject has not yet been conclusively determined. The advance of protein therapy has stimulated an enormous amount of research on the effects produced by the injection of proteins, and from the results, conflicting though they sometimes appear to be, we have been able to derive some valuable information.

According to Vaughan and others, the parenteral (hypodermic) introduction of foreign proteids excites the formation of specific ferments in the injected animal. These ferments are activated by a second injection of the same proteid, and have the power of splitting up the proteids into a poisonous and a non-poisonous portion. An excess of the poisonous products of protein cleavage will give rise to toxic symptoms. These closely resemble the symptoms of anaphylactic shock—a resemblance often very marked in some cases of serum sickness. The chief features of the reaction produced by these products are: increased secretion of glands, increase in the antibodies and proteolytic ferments of the blood, and increased permeability of the capillaries of the liver and skin (Petersen). This increased permeability results in an increased lymph-flow, which carries into the blood a variety of the products of cell metabolism (Clark). The effect on the skin capillaries is intimately connected with the production of urticaria, and the endermic injection of protein poisons has been shown to give rise to wheals. The theory that histamine, which produces similar effects, might be the active principle of these toxic bodies has been disproved (Clark).

It has been suggested that serum sickness is a form of auto-anaphylaxis, in which a portion of the injected serum remains unaltered in the subject, ready, after sensitisation has taken place, to play the part of a reacting dose. This seems feasible, but in the period of reaction one would expect to find similar antibodies in the blood in both serum sickness and anaphylaxis. Experimental evidence does not support this. Indeed it has been stated that the anaphylactic state depends on the presence of antibodies in the tissues and their absence from the blood. Friedmann is of opinion that anaphylactic antibodies are of the nature of hæmolysins, and Kritchevsky's recent work on the rabbit supports this view. Volta, however, considers that conclusions based on complement-fixation experiments

cannot be upheld in the case of serum sickness. His experiments show that the injection of horse-serum provokes, in man, the production of specific "hæmo-agglutinins," which have a very definite agglutinating action on the red cells of the blood of the horse. The reaction is analogous to that which occurs when bacilli are acted on by their specific serum. The reaction requires an incubation period of 6 days, and attains its maximum intensity about the 12th day. It could still be obtained after 4 months. The intensity of the reaction was found to be proportionate to the clinical manifestations, being most marked in cases where the symptoms, notably the rash and joint pains, were most severe. The fact that Volta's work is in such close accord with our previous clinical observations carries considerable weight, and if confirmed, will mark a decided advance in our knowledge of the ætiology of serum disease.

Some workers in this country have endeavoured to associate serum disease with the presence of precipitins in the blood, but Wyard, from observations based on the study of 51 cases, has found it impossible to establish any connection. He concludes that men, whose blood contains these antibodies, are not in any way more susceptible to serum disease than those in whose blood they are absent. Busacchi has studied the question of diphtheria toxin as a possible factor. Though obviously not the cause, toxin has, as I hope to show later, an important modifying influence on the development of serum phenomena. On the highly controversial question as to the precise relationship between anaphylaxis and serum sickness, I do not propose to comment further than to state that whatever may be the ætiological association, clinically, at any rate, demarcation is possible. I refer, of course, only to the "normal reaction" seen in subjects who have not been sensitised by a previous injection of serum. In a sensitised patient, the differentiation between what constitutes merely serum sickness and what might be termed anaphylaxis is often only arbitrary.

The serum phenomena.—The most characteristic feature of the reaction is the appearance of a rash, but a prodromal stage can sometimes be distinguished. Perspiration, even within a few hours of injection, and oliguria, are the earliest signs. Drowsiness, at all events on the day preceding the eruption, is common, but the eruption itself is usually the first definite manifestation. It comes out on the 7th or 8th day, but may be delayed for a further period of from one to four days. It rarely develops later than the 14th day following injection. In one exceptional case, recently under treatment in the Grove Hospital, a rash was first noted on the 33rd day, but as it was of the circinate variety, it may have been only secondary to an earlier rash which escaped notice on account of its transient character. The area surrounding the site of injection is

usually first affected, and this holds good whether the serum has been given subcutaneously, or intramuscularly. A preliminary erythema, sometimes punctate, is the initial, and in severe cases may be the only phase of the eruption. It must be distinguished from the redness, often seen shortly after injection, which may be caused by the insertion of the needle.

This preliminary erythema is rapidly succeeded by the characteristic rash.

Urticaria is the common type, but erythema multiforme, scarlatiniforme, or maculo-papular types may be met with. A circinate appearance is more usually associated with a secondary rash. Scarlatiniform appearances may occasion some difficulty in differential diagnosis, especially if, as sometimes happens, the rash is accompanied by pyrexia, which may last for as long as 10 days. The rash may persist for 3 or 4 days and may exhibit a protean propensity, changing in character almost as observed, or it may fade and reappear at intervals during a similar period. If very intense, it may be followed by slight desquamation.

The urticarial variety often gives rise to considerable and sometimes almost intolerable irritation. Adults complain most of the discomfort, particularly at night; but the numerous scratches seen on the abdomen and buttocks of children who have had a marked eruption show that they, too, may suffer.

Vomiting may occur, but it is more common and more severe in "accelerated" reactions. Œdema, marked by puffiness under the eyelids and swelling of the extremities, is not seldom seen, but orchitis, recently reported by Blechmann and Stiassnie, and Carrieu, must be extremely rare. It was not noted in the present series. Joint pains may add to the discomfort of the patient, but these are more often among the later sequelæ, which develop in a certain percentage of cases.

Volta claims that his hæmo-agglutination test may be utilised in differentiating a serum urticaria from an urticaria of other origin. As the number of cases in which the question of diagnosis might arise are few, and the technique of the test elaborate, the physician will continue to make the distinction on clinical grounds alone.

In certain cases serum phenomena do not terminate at the stages just described. After a varying number of days, exceptionally as long as 12, a supplementary rash may appear, but very frequently, especially in patients who have received large daily injections of serum, the primary rash merges almost imperceptibly into the second. The 12th day following injection is the one on which the secondary rash is most likely to be observed, and if not circinate from the beginning, it will in all probability assume this appearance later. Its duration is similar to that

of the earlier urticaria. After the fading of the rash slight staining may be left. This staining may resemble that seen in measles, but is sometimes hæmorrhagic. Pyrexia is common, as is also conjunctival injection, and adenitis. The adenitis may be cervical, axillary, or inguinal. Protein injections in experimental animals may cause considerable hepatic enlargement (Maunter and Pick). This, however, is more likely to occur when the method of administration has been intravenous. This is not met with in the human subject as one of the sequelæ of subcutaneous injection, and I have not so far heard of it as a result of intravenous. Liver enlargement, as Marfan and Rolleston (1904) have shown, is frequently associated with fatal cases of diphtheria, but in these the usual serum sequelæ are absent or only very slightly marked.

The joints which may be affected are the wrists, elbows, shoulders, ankles or knees. Muscular pains in the limbs may also be complained of. As in rheumatic fever, the tendency is for these pains to flit from joint to joint, but in many cases, only a single joint is involved. As Rolleston has pointed out, the rash and joint pains usually co-exist, but either may be the only symptom present. The pains usually last for from 2 to 3 days. Concomitant symptoms are slight headache, anorexia and depression.

Sometimes a few specks of exudate may be seen on the tonsils—a condition to which Rolleston (1906) has given the name of *Angina redux*. In patients who have previously exhibited signs of laryngeal obstruction a return of the croupy symptoms may cause some anxiety, but operative interference is unlikely to be called for.

An abnormal reaction may follow a first injection of horse-serum. The symptoms are those of anaphylaxis. The reaction sets in almost at once, and is characterised by dyspnœa, cyanosis, respiratory failure and collapse. The victims are chiefly asthmatics, about 4 per cent. of such individuals being susceptible. Only about one case in 50,000 dies after primary injection, but as small a dose as 1 minim has been recorded as having brought about a fatal issue (Stitt). The type, however, with which we are familiar in fever hospitals is that met with in patients who have previously received serum treatment. It is possible that, once established, the sensitised state may last indefinitely. This type is subdivided into three groups.

In Group (*a*) the reaction appears in not less than 7 days after injection. The symptoms are those of the normal reaction, but they are of greater severity.

In Group (*b*) the reaction appears after any time from 12 hours to 6 days. As a rule its course is similar to the aforegoing, but it may be anaphylactic in character. The "accelerated reaction" is the name applied to this group.

In Group (*c*) the reaction—"immediate"—may develop within an hour of injection, but it may occur up to 5 or 6 hours.

Its features are a severe rash, accompanied by vomiting, cyanosis, dyspnœa, faintness and collapse. The temperature is at first normal or subnormal, but later it may be raised.

The frequency of serum phenomena has a very intimate bearing on the question of prognosis, and for this reason it must be considered in some detail. In any computation of frequency the rash, which is the most constant and most reliable sign, must be taken as the index. Table II shows that the figures of various authorities differ considerably. Even after due allowance is made for the differences in serum, and the liability of evanescent rashes to upset calculations, there remains a very considerable disparity. (I believe I am correct in assuming that unconcentrated serum was used by the observers referred to.) It is a significant fact that Ker, who advocates a much lower dosage than that in use in the London Fever Hospitals, records the lowest figures, while Rolleston, in whose cases the doses ranged as high as 78,000 units, records the highest. The discrepancy is, therefore, very largely explained by the amount of serum used.

What are the factors which determine the appearance of a reaction in any particular case? These are (1) dosage, (2) type of serum used, (3) individual idiosyncrasy, (4) severity of the disease.

The first has already been discussed. With regard to the second, it is claimed that the use of concentration methods in the preparation of serum has resulted in a noteworthy reduction in the incidence of serum sickness. This may be correct, but on account of its expense this type of serum is not used on any considerable scale in this country. We frequently admit patients to hospital who have been injected with concentrated serum by their medical attendants, but as the doses are almost invariably too small re-injection is the rule. For this reason we have few opportunities of observing its effect. In this connection it may be noted that Walbum has discovered that in subcutaneous injection, sera with normal protein content are best absorbed, the more concentrated showing a less efficient absorption. Madsen states that "there is a tendency at the present time to concentrate and 'purify' the antitoxic sera, especially by means of the recently introduced precipitation methods, but it may be advisable to point out that it is very necessary to test whether under the concentration process they have preserved their power to be absorbed, unaltered."

It has long been known that the sera of different horses may show a decided variance in toxic qualities. Individual idiosyncrasy is of some note, and apparently this may be familial. Included in my series are

the cases of a mother and three daughters. All received serum, and the quantity and brand used were different in each case. They were not admitted to hospital simultaneously, and they had attacks of diphtheria of varying severity. Although the brands used produced the usual quota of reactions in other patients, no member of this family was in any way affected.

In examining a large number of cases, it is reasonable to suppose that these factors will tend to offset each other.

From a cursory glance at Tables III, IV, V, one will have little hesitation in inferring that the severity of the attack exercises an important influence on the frequency of the serum reaction, and that this relationship may be made use of from the standpoint of prognosis.

TABLE II.—*Frequency of Rashes.*

Observer.	Percentage.
Sturtevant	5–30
Ker (Series 1)	18
Ker (Series 2)	25·5
Goodall	40·1
Brownlee	47
Rolleston (1907)	66·7

TABLE III.

No of cases, 1000. Average dosage per case, 25,200.

Number showing serum reactions	765	Percentage	76·5
Number showing no reaction	235	„	23·5

Showing how dosage affects the frequency of serum reactions.

Classification.		
1. Mild cases	Dosage	3–12,000 units.
2. Moderately severe	„	13–24,000 „
3. Severe	„	25–48,000 „
4. Very severe	„	49,000 „ and upwards.

	No. of cases.	No. showing reactions.	Percentage.
Class 1	307	225	73·2
Class 2	321	250	77·8
Class 3	268	218	81·3
Class 4	104	72	69·2
	1000	765	76·5

In compiling this table, only cases of clinically definite faucial diphtheria were considered. Cases which terminated fatally before the day on which a rash might reasonably be expected, and patients who suffered from any concurrent disease within 14 days of injection, were not included. Patients who had been sensitised by a previous injection were also omitted. Two cases in which joint pains were complained of, but in which no rash was seen, are counted as negative.

Influence of dosage on frequency.—I have already referred to the suggestive fact that authorities who favour small doses record comparatively small percentages of reactions. The first three classes in Table III seem to confirm this view. It is interesting, though possibly not of great import, to note that the frequency seems to increase by approximately equal increments. If this ratio of augmentation were maintained throughout the series, the figures for Class 4 would be about 85 per cent., instead of which we get 69·2. Are we to infer from this that very large doses give fewer reactions than very small ones? The explanation of the apparent anomaly is to be sought for, not in the amount of serum given, but in the severity of the disease. The large dose is an index of the severity of the disease, and presumably when we reach Class 4 we have reached a point where even a largely augmented dosage is insufficient to keep the percentage at its former figure, let alone raise it. So great an authority as Bie has stated that the enormous dosage at the Blegdams Hospital has apparently produced no appreciable increase either in the frequency or in the severity of the reaction. At the Copenhagen Hospital the practice is to give large doses intravenously, and their excellent results testify to the efficacy of this treatment. As regards cases of the grave toxæmic type, few will doubt Bie's assertion, but one is not inclined to go so far in respect of the less severe forms. It must be remembered that Bie is now using a concentrated serum for intravenous work which contains no less than 1200 A.U. per c.c. I have frequently observed that with an intensive dosage, given subcutaneously, though not all in a single injection, one rarely fails to find some signs of a reaction after the ninth day. Even in many of the worst cases a rash, though delayed and usually modified, will make its appearance if large daily injections have been given. The non-appearance of the eruption is a portent which presages a serious and often fatal termination to the case. In milder forms it is naturally not of much significance as an index of prognosis. Goodall is of opinion that serum phenomena are now less severe than formerly. They do not seem to be less frequent.

Mortality.—In making a computation of the incidence of the reaction in fatal cases a series of 100 was taken, only those cases being selected

in which the patients survived long enough for serum phenomena to develop, *i. e.* at least eight days after injection of antitoxin. Fatalities which might have been influenced by concurrent diseases, tracheotomy, etc., were not included. As the series of 1000 cases was not large enough to include 100 deaths, the deaths in the series have been supplemented from the records of the hospital. To find 100 cases conforming to these conditions it was necessary to include almost the entire number for the years 1920, 1921, 1922.

TABLE IV.—100 *Fatal Cases. Average Number of Units per Patient A.T.* 66,330.

Duration of survival.	
8 days	6 cases.
9–11 ,,	28 ,,
11 days and over	66 ,,
	100

	Secondary rashes.	Rash followed by pains.	Good rash.	Slight rash.	Rash limited to injection site.	Total.
No showing reaction.	0	3	5	10	8	26
No. showing no reaction.						74
		Total				100

Prognosis.—What inferences may be drawn from this highly instructive calculation? Obviously the rash is only seen in about a fourth of those cases which are to have a fatal ending, and apparently a well-marked reaction can only be expected in 8 per cent. of cases. No secondary rash was seen. As already stated, these serum phenomena were those recorded in a large hospital over a period of three years. It may, therefore, be assumed that the appearance of a secondary rash must be excessively rare in a fatal case. A secondary rash, then, may be taken as a harbinger of recovery.

Joint pains only figured three times in the fatal series in the same period. Their appearance would seem to be a very encouraging omen.

When we look at the difference in incidence between the mortality table and Table III, it becomes evident that a reaction of any kind is greatly in favour of the patient. Even a few spots round the site of injection may give grounds for hope, and a well-marked rash constitutes a good prognosis as regards mortality. This, as the clinical records of

more than one of my cases goes to prove, may hold good even in the presence of marked hepatic enlargement and hæmorrhagic manifestations.

Does the appearance of a reaction have any relationship to the time a patient may be expected to survive? It has. In the 100 cases the average number of days survived by the 26 reacting cases was 23·7. In the 76 remaining cases the number of days survived was only 15·9. So we may gather from this that if a rash is seen the patient's chances are good; and even if death results it is likely to be deferred.

TABLE V.—*Cases of Paralysis in the Series. Total Number* 215.

	Reaction.	No reaction.	Percentage of reactions.
Mild and moderately severe	122	37	72·7
Severe	16	40	28·5
Totals	138	77	64·1

From the study of this table it is evident that reactions appear in the milder forms of paralysis only a little less frequently than they do in the average case. In the severe type, however, the percentage of reactions is very markedly reduced, and it will be noticed that the percentage very closely approximates that recorded in fatal cases. It is not illogical to assume that a similar inhibitory process is concerned both in the fatal and graver paralytic cases. Here again it may be stated that, as the percentage of severe cases which show the reaction is so decidedly reduced, a good serum reaction is of good prognostic import. The converse is, in this type of case, almost equally applicable.

TABLE VI.—*Secondary Phenomena. No. of Cases considered,* 1000.

Rash only.	Rash and joint pains.	Pains only.	Rashes, total.	Phenomena, total.
84	51	52	135	187

Percentages: Total rashes, 13·5; total pains, 10·3.

TABLE VIA.—*Total Number* 215. *Paralysis Cases.*

	Mild and moderately severe.	Severe paralysis.
Secondary phenomena	24	1
Percentage	11·1	0·46

The secondary phenomena as a prognostic index.—The secondary phenomena are, as we see by this table, relatively infrequent. In 1905 Rolleston compiled some tables dealing with a series of 568 of his cases.

His percentages for rashes and joint pains were 19·08 and 10·24 respectively; seemingly the earlier phenomena are now slightly commoner, while the latter do not seem to have varied much. The secondary rash is not always easy to differentiate, as in many cases the tendency is for the earlier eruption to merge into the later. When a rash is of the same type throughout both stages classification becomes a matter of some difficulty.

The secondary rash as a prognostic factor is much more reliable than the urticaria. Its appearance, apart from the fact that the patient will by then have reached the tenth or twelfth day is an exceptionally favourable sign. The rarity of the rash in cases destined to suffer from severe paralysis is a striking feature, and even in the milder forms of paralysis this rash is far from common. It will be remembered that the primary rash, while it suggested that the probabilities were against severe paralysis ensuing, gave no grounds for expecting immunity from any form of paralysis. In my comments on Table IV, I made reference to the favourable significance of the latter phenomena in respect to mortality; but with a realisation of the lethal properties and insidious workings of the toxins of diphtheria, one almost states an axiom in saying that all prognostic rules may be falsified by the treacherous nature of the disease. Nevertheless, the rule that a secondary rash means recovery will be found to have very few exceptions. This rule cannot be held to apply to such secondary appearances as joint pains, pyrexia, etc., when these are present without the circinate rash. These signs, though most encouraging, are fallacious—a fact of which I was forcibly reminded by a recent case. This was that of a girl, aged 14 years, who, after surviving an initially severe attack, appeared to be making an uncomplicated and uneventful recovery. A well-marked primary urticaria was followed by troublesome joint pains, and the outlook seemed favourable, though, on account of the early severity of the disease, I deemed it advisable to keep the patient recumbent. No secondary rash appeared, and on the forty-eighth day after admission pharyngeal paralysis ushered in a fatal termination.

The inhibitory influence of toxin on the reaction.—We have seen how increased dosage raised the incidence of serum manifestations to a point at which other factors began to exert an antagonistic influence; and how the percentage of reactions was successively lowered from 81·3 to 69·2 in very severe faucial attacks to 28·5 in the graver varieties of paralysis, and finally to 26 in fatal cases. Even granted that different estimations would show a certain discordance, it can hardly be doubted that the disparity is too great to be accounted for on the basis of erroneous comparisons. As the inhibitory influences reached their maximum in

the groups where one would expect the severest toxæmia, the antagonistic force must, almost assuredly, be the toxin of diphtheria. The influence may be exerted directly on the antibodies in the circulation which are associated with serum disease, or indirectly by limiting the response by the tissues to the introduction of foreign proteids. Rolleston (1905) instances the parallel of smallpox, where the absence of the usual inflammatory reaction in the skin surrounding the pustules is a well-known and ominous indication of certain malignant forms. He suggests the possible explanation that the toxins exercise a "profound vasomotor depression." Most authorities are agreed that diphtheria toxin, after having invaded the blood, quickly disappears from it again. It is in the tissues that it chiefly exerts its baleful influence. The most probable explanation of the inhibitory process seems to be that toxin, having become bound up in the tissue elements, renders them too inert to exercise their normal resistance to foreign proteids.

The prognosis of serum sickness itself remains to be considered. Despite the temporary, though often severe, malaise, it is doubtful if its influence is ever ultimately deleterious. I except, of course, the somewhat rare cases of anaphylaxis. The superaddition of one malady to another is hardly likely to be beneficial, but in some exceptional instances it may be so. This is exemplified by the success which has attended the treatment of general paralysis by the inoculation of the plasmodium of malaria. In severe diphtheria the association of a happy result with the presence of a good serum reaction would seem to indicate that serum sequelæ may possibly exercise a slightly favourable influence on the course of the disease. In the Harben Lectures for 1922 we find Madsen stating: "We have frequently had the opportunity of observing that an inflammation occurring in an antitoxin-producing animal may be accompanied by a considerable rise in the antitoxin formation." He referred chiefly to the horse, but De Lavergne and Zoeller have demonstrated that man possesses a greater capacity for antitoxin formation than was formerly supposed. That the mild inflammatory process which accompanies the serum reaction may have the power of stimulating antitoxin formation is not altogether improbable, but the production, from this source, could hardly be of an amount sufficient to have a therapeutic value.

Conclusions.—Increased dosage increases the incidence of serum manifestations, but diphtheria toxin exercises an inhibitory influence both on the frequency and the intensity of serum reactions. In very severe cases the rash is late in development, scanty, or entirely absent. The presence of a rash, even of the most limited nature, is a favourable sign. A good rash suggests a good prognosis. A case with a well-marked reaction is not likely to end fatally, and the appearance of a rash affords

some assurance that severe paralysis is unlikely. A primary rash is valueless in forming an estimate as to the likelihood of paralyses generally, its value being restricted to the severer forms. A secondary rash enables one to forecast with confidence that a patient will neither die nor suffer from a paralysis of any of the graver types.

I am indebted to Dr. J. H. Whitaker, Medical Superintendent of the Grove Hospital, for allowing me access to the hospital records. I must also thank Dr. J. D. Rolleston for many helpful suggestions, and for placing at my disposal many of the works to which references have been made.

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A CLINICAL STUDY OF MUSCLE-TONE IN RICKETS.

By J. D. Douglas Galbraith, M.D.

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Attention has often been drawn to the striking loss of tone in the muscles in rickets, and opinion is divided as to whether this is primary or merely secondary to disease. Findlay (2) discusses this question, and quotes Hagenbach, Burckhardt and Bing, who considered that rickets is a distinct and specific dystrophy. Recently Banu and Bourguignon (1) have corroborated the degenerative changes in the muscles of rachitic children previously described by Bing. On the other hand, Heubner (6) and Zappert (11) thought the muscular weakness was due to pain in the limbs. P. S. Henderson (5), working with the muscles of rachitic puppies, found the creatin content definitely decreased, and quotes Pekelhering (10), who correlated muscle-tone with creatin (methyl-guanidin acetic acid). She deduced from this that there is a profound change in the metabolism of the muscles in rickets, and recently Noël Paton (9) has suggested that an error in the metabolism of lecithin may be a causal factor in a failure of bone-formation in rickets. Noël Paton thinks that part of the excess of the methyl-guanidin formed from cholin, which is liberated in the metabolism of lecithin, may be linked to acetic acid to form creatin.

During a course of a clinical study* of the *rôle* played by the fat-soluble A vitamin in the ætiology of rickets I was strongly impressed by the importance of this question of muscle tone. During the investigation about 750 radiograms of rachitic children were taken, and it was soon evident that although there was generally approximate agreement between these and the clinical findings, this was by no means universal. For example, in the comparison of the effects of various remedial measures on the progress of cases of active rickets the following combinations frequently occurred :

(1) Radiographically healed, or almost healed, bones with only slight clinical improvement.

(2) Little or no bone healing as evidenced radiographically, with marked clinical improvement and the child walking unsupported.

The first group consisted for the most part of cases treated with cod-liver oil or phosphorus, and the second of those treated by massage during the winter months. One would not, of course, expect that the radiographic and clinical improvement would absolutely coincide, but still it seemed reasonable to expect that after a child had been walking

* 'Quart. Journ. Med.,' 1923, xvi, p. 321.

alone for six months or more, and had been in good general health, the bones would be fairly normal. The converse—that the bones would steadily heal in the absence of clinical improvement—is even more difficult to understand. Does this mean that calcium metabolism, as evidenced by ossification, has become normal but that rickets remains? The following case-histories will illustrate these points:

(1) E. W—, aged 2 years 3 months, had phosphorus administered for six months in hospital, her exercise being restricted, and at the end of that period the radiographs were almost normal, yet clinically there was no improvement; the child made no attempt to stand, the muscles were flabby and the limbs were very tender.

(2) G. McD—, aged 3 years 6 months, had massage at the Out-Patient Department and walked alone in six weeks. After that he kept very well and was running about all day long, yet a radiograph taken six months later still showed a moderately severe degree of rickets.

Cases of the latter type suggested that it might be of interest to see the condition of the bones in older children with rachitic stigmata who had been apparently well and running about for long periods. Accordingly 8 children, ranging in age from 1 year 11 months to 6½ years, were radiographed. These were children brought to the Out-Patient Department for some minor ailment. Some of them had been walking alone for two and a half years, the only remaining evidence of the rachitic condition being a degree of genu varum or valgum, a "rosary" or some epiphyseal enlargement. All the radiographs were taken during winter and evidence of deficient calcification was apparent in every case, and in some of the cases the bony lesions were as severe as those observed in children who were making no attempt to stand. For example, radiographs of twins, aged 3 years 4 months, showed that there is little difference in the severity of the bone lesions, yet the girl (A. McK—) could only stand with much support whilst her brother (J. McK—) had been running about for one and a half years.

What, then, is to be our criterion of the arrest of the rachitic process? Is the child cured who has fairly normal bones but is unable to stand, and has the child still got active rickets who is running about and appears to be very well, but whose bones still show moderately severe rachitic changes? If it is admitted that rickets is a general disease and that the bone changes are only one of the manifestations, then so soon as the general health becomes good and the child runs about freely it would seem justifiable to conclude that the disease is at least arrested, even although the radiographs still show definite failure of calcification.

The fact that clinical improvement can be so marked whilst calcification remains deficient, and that the converse also occurs, would suggest

that the healing of rickets is not merely a question of putting right the calcium metabolism, for we know the muscles are not deficient in calcium.

All clinical observers are agreed as to the very striking loss of muscle-tone in the disease, but what I wish to emphasise here is that, in this investigation, whereas the severity of the "rachitic process"—meaning thereby impairment of the general health and inability to walk—could not always be determined from the radiographic picture, the condition of the muscles was always a true index to this. The condition of the muscles has, in my experience, been a truer index to improvement; once the tone increases the child improves both in ability to walk and in general health no matter what the radiographic appearance be. The response of the muscles of rachitic children to treatment by massage and electricity is striking. One month is the average time necessary to get severe cases of rickets to walk unsupported, and the improvement in the general health is as marked as the improvement in the rickets (8), although, in the winter months, the radiographs show practically no change. For the first few applications of the massage the limbs are undoubtedly sore and the child cries a great deal; but within a few days this tenderness wears off and the child will stand on his feet without complaint. The tenderness of the limbs in rickets is usually considered to be "bone tenderness," but its rapid disappearance under treatment by massage suggests to me that the tenderness is not in the bones but rather in the muscles. Bone tenderness, as in chronic osteitis, is certainly not lessened by vigorous rubbing; on the other hand, muscle soreness, as after vigorous unaccustomed exercise, is at first increased by further exercise and then diminished.

Is it possible after all that the changes in rickets are primarily in the muscles and that the bone changes are secondary? If so, then all the conditions which tend to devitalise muscle would favour the onset of rickets. The "hygienic school" holds that rickets is due in some way, not to conditions of bad diet, but to conditions of bad hygiene, and hygienic conditions are very important factors in the maintenance of muscle-tone. For muscle-tone depends, to a very great extent, on the stimuli the muscle receives from exercise, moving air and sunlight, although diet, too, may influence it to a lesser extent. Leonard Hill (7, 8) has demonstrated the influence of fresh air on metabolism, and the physiological effects of fresh air and sunlight are gradually being put on a surer physiological basis. If, then, we have confinement, a moist atmosphere, loaded with the products of respiration, and an absence of moving air and of sunlight, we have most of the conditions leading to depression of muscle-tone. These are the exact conditions to be found in the slum

houses producing rachitic children, and which Hutchison (4) found in India in the better-class houses where rickets was rife. Conversely, it has been shown that exercise, fresh air, sunlight and ultra-violet rays will both prevent and cure rickets.

Conclusions.

(1) The radiographic and clinical pictures in rickets, whilst showing general agreement, often show marked discrepancies.

(2) The variation of calcium metabolism under different conditions, so far as one can accept ossification as an index of calcium metabolism, suggests that the disturbance of calcium metabolism may be a concomitant of rickets rather than the primary change.

(3) Emphasis is laid on the condition of the musculature in rickets, and from clinical observations support is given to the view that the disease may involve the muscles as well as the bones.

(4) Bad hygienic conditions, by depressing muscle activity, would be strong predisposing factors to the development of rickets.

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A CASE OF EPISPADIAS ASSOCIATED WITH COMPLETE INCONTINENCE TREATED BY RECTUS TRANSPLANTATION.

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The condition of epispadias, associated as it is with an absent or incomplete urethra, and consequent lack of control over micturition, with constant leaking of urine, is so distressing, not only to the patient, but also to the relations, that any operation which is designed to relieve the condition, provided that it be founded on sound principles, is worthy of consideration.

The operation of transplantation of the ureters into some portion of the large intestine, which has been performed with marked success by Sir Harold Stiles and Sir Berkeley Moynihan, lays itself open to the objection that if it should fail the patient will probably die.

In the brilliant cases which are recorded by these two surgeons the sphincter ani muscles are used for controlling the flow of urine, which is passed into the intestine and rectum and there is thus no incontinence. On the other hand, ascending nephritis is more than likely to occur when less skilled surgeons are responsible for the treatment. Moreover, in those, presumably, rare cases where transplantation of the ureters has failed, and yet the patient has survived the immediate effects of the operation, it would be extremely difficult for any surgeon to do anything further to relieve a condition which might be worse than that which called for treatment.

In a word, transplantation of the ureters is what may be salled a final operation, in which the bladder is irretrievably divorced from the urinary tract.

Sir Harold Stiles has laid it down, as an axiom, that no operation is worth considering in these cases unless some sort of control over micturition is provided. This is a very clear ruling which should never be neglected. However brilliant a manipulator a surgeon may be, unless he provides a sphincter capable of controlling the flow of urine, he had better not interfere with the patient in any way in such cases.

I shall now describe an operation for the relief of incontinence in these cases of epispadias which I have performed on two occasions before the one immediately to be recorded. Of these two cases, the first, that of a boy, was reported in the ' Lancet,' October the 16th, 1920, p. 790. This case, and a second case, that of a girl, were reported in further detail in the ' Proceedings of the Royal Society of Medicine ' 1921, xiv, Section of Urology, p. 57.

The first case was practically a success. The second case is only a partial success, but one is not prevented from doing something further, as one would have been if a ureteric transplantation had been performed and had failed.

In a word, an efficient operation without going to the last resort, namely, transplantation of the ureters, enables us, if for any reason it should fail, to have a reserve operation in hand in case it should be wanted.

The principle of the operation is this : The right rectus muscle may be divided just below, or at the level, of the umbilicus, split, and turned downwards, the split ends being placed in a deep wound which is made around the orifice of the " urethra " in the male, and round the whole

vulval orifice in the female. The distal ends of the split muscle are united to each other, so that a " sphincter urethræ " is formed.

It is my belief, founded on dissections, that neither the blood nor nervous supply is interfered with by this method of operating.

The deep epigastric artery passes upwards and inwards towards the navel, and is adherent to the posterior surface of the muscle. When the muscle is divided the artery requires a ligature, but as it dispenses frequent transverse branches to the muscle in its upward course the blood-supply to the transplanted rectus remains excellent. I have also had observations made showing that the two thirds of the rectus which lie below the navel are supplied by the twelfth dorsal nerve, which enters the muscle quite close to its insertion, and passes upwards, splitting into two vertical branches in its upward course. The nerve as it enters the muscle thus lies on the plane of rotation of the transplanted rectus, and is thus not interfered with. At the three operations I have performed the nerve was never even seen.

The history of the case is as follows : A girl, aged 5 years, was admitted into Milne Ward, Royal Free Hospital, under the care of Mrs. Vaughan Sawyer on December the 11th, 1922, suffering from dribbling of urine. Several medical men had been consulted about her condition, but no operative treatment had been attempted. Ointment and powders had been applied in order to prevent soreness of the vulva and adjacent parts. The patient was first brought to see Mrs. Vaughan Sawyer in July, 1922, and again early in November. A small rubber urinal was made for the patient in August, but it was not very satisfactory.

The patient is a healthy-looking, well-nourished, child with curly fair hair. The vulva shows signs of inflammation. Examination of the parts under an anæsthetic revealed the following condition : There is no fat on the mons. Both labia minora and majora are widely separated in front. There is a well-marked suspensory ligament passing downwards and backwards. Immediately behind this is a large circular patulous opening, which is capable of admitting the passage of a No. 12 catheter (English size). There is no clitoris. Through this opening urine is constantly leaking away. Behind this opening is the opening of the vagina, which is only about a quarter the size of the opening of the bladder. I saw the case with Mrs. Vaughan Sawyer, and considered it to be a most suitable one for transplantation of the rectus muscle. Mrs. Vaughan Sawyer concurred

I performed an operation as follows on January the 25th, 1923. Miss Staveley, Mrs. Vaughan Sawyer's house-surgeon, was the chief assistant ; and Mrs. Sprott administered the anæsthetic.

The patient was placed in the lithotomy position. An oval incision

was made around the vulval orifice and about $\frac{1}{4}$ in. away from the margin. The incision was deepened to about $\frac{3}{4}$ in. depth all the way round. There was very little hæmorrhage, which was arrested completely by sponge pressure.

An incision was then made beginning over the middle of the right rectus at the level of the umbilicus, and carried vertically downwards for the greater part of its length, but in the lower part was carried inwards to join the upper, and right, part of the first oval incision. The incision was carried through the anterior layer of the rectus sheath. The edges of this discoid layer were everted; the rectus muscle was exposed and divided right across, $\frac{1}{2}$ in. below the level of the umbilicus. The deep epigastric artery spurted strongly when divided, but the divided and proximal end was at once secured and ligatured; the ligature included a small portion of the rectus muscle. The lower part of the divided rectus was lifted up from its bed, the deep epigastric artery remaining attached to its posterior surface. The rectus was then turned downwards on its insertion. The muscle was then carefully split into two parts as far as possible along the length of its fibres. No fibres were apparently torn, nor was any nerve fibre obviously divided. There was no bleeding; the muscle was split to within 1 in. of its insertion. The median portion was placed in the left part of the oval incision. The lateral portion was placed in the right part of the incision. The two parts met each other in the posterior part of the incision, and their free ends touched each other without it being necessary to apply any force to enable them to do so. The adjacent ends were united securely with catgut sutures, great care being taken that the sutures should not act as ligatures. A catgut suture was also used to fix the ends of the muscle approximately to the central part of the perinæum, as it was thought advantageous to have the sphincter ani externus as an opponent to the new "compressor urethræ." The basal portions of the split muscle were also united together with one or two catgut sutures. The new compressor was now in position. The proximal end of the divided muscle was now united with one or two catgut sutures to the rectal sheath. The anterior layer of the sheath was sutured, care being taken that the lower sutures did not constrict the base of the transplanted muscle. Fortunately the child was stout and well nourished, and the fat in the whole length of the incision was united with interrupted catgut sutures applied Lembert-wise, so as to bury the rectus sheath above and the transplanted rectus muscle below as deeply as possible. The skin was sutured appropriately with salmon-gut sutures. Merck's dermatol, on the recommendation of Mrs. Vaughan Sawyer, was applied, and the usual dressings were put on the wound; a self-retaining catheter

was inserted into the bladder and drainage provided for by this means. The large circular orifice of the urethra, or rather bladder, had become now a mere sagittal slit. The wound gaped a little posteriorly, but there was no suppuration. No catgut sutures were seen in any of the dressings. An interesting feature should be here noted. The transplanted rectus formed a distinct oval, ring-like swelling round the vulval orifice. This swelling is still present, and may perhaps in future cases form a useful indication as to the success of the transplantation.

After-history.—The patient did well after the operation, the wound healing by primary union. A salmon-gut suture in the perinæum was removed on the second day after the operation. There was at first a good deal of pus in the urine, but this diminished and disappeared eventually. The remaining salmon-gut stitches were removed in ten days' time, and the catheter was dispensed with on the fifteenth day.

On February the 17th, *i. e.* three weeks after the operation, it was reported that the child was not wetting her bed so frequently, especially at night. When I saw the patient on that day the bladder opening was much smaller and slit-like. She walked up and down the ward without leaking the least drop.

The further history was most gratifying.

On February the 28th, when she was shown before the students at Guy's Hospital, she was able to hold her water for at least two hours in spite of being very nervous.

She got into the way of asking to go to the lavatory, and was discharged at the beginnning of March, 1923, when she went to a convalescent home at Newbury.

On March the 26th Miss Staveley reported that the child wetted herself only once a day on an average, and never at night.

On April the 8th after her return home her mother reported that the child had passed three whole days without wetting herself.

On April the 26th, 1923, the day of the Royal wedding, the patient came up early in the morning and wandered about London with her mother. She was shown at a meeting of the Urological Section of the Royal Society of Medicine at 8 p.m. Although very tired she was quite dry.

There is no sign of ventral hernia. The question as to the control of the flow of urine appears, from a consideration of this operation, to be at any rate partially solved.

I have investigated this subject of congenital abnormalities of the lower urinary tract during several years, and I am inclined to think that the choice of operation must depend to a great extent upon the sex of the child.

I am only too ready to accept Sir Harold Stiles' advice as regards the necessity of providing a sphincter in order that the flow of urine may be controlled.

In a male case of epispadias—the first in which I performed rectus transplantation, the muscles of the perinæum were well marked and clearly differentiated from each other, as evidenced by dissection, and the bladder and prostatic urethra were well developed, and I should therefore be tempted to expose the true "compressor urethræ" muscle, and if I found it, bring the distal part of the prostatic urethra through it into the perinæum, before attempting rectus transplantation. In the female, however, the muscles are in normal cases so small that I should not feel justified at present in trying to expose the perinæal muscles in one of these abnormal cases, and should at once proceed to rectus transplantation.

The question of the transplantation of both recti has been raised; my objections to it are these:

(1) It will prolong the operation.

(2) If for any reason—and we can never be sure of asepsis in these cases, at any rate at present—it should fail, there is nothing for it but transplantation of ureters, whereas if the single rectus transplantation should fail efforts might be made to bring the other one down before calling on one's last reserve, namely, ureteric transplantation.

The greater likehood of hernia occurring with double rectus transplantation would be, for me, a merely academic question.

I desire to thank Mrs. Vaughan Sawyer for her great kindness in asking me to see the case, allowing me to operate upon the patient and for permission to publish these notes.

TWENTY-FIVE CASES OF WHOOPING-COUGH TREATED BY INJECTIONS OF ETHER.

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The present article contains a short account of 25 cases of whooping-cough which occurred at the Benachi's Orphanage, Alexandria, in August, 1921, of which I am the visiting physician. In about a week 25 of the 160 inmates were attacked with the characteristic cough, and among them ten presented a grave form, both as regards the frequency and intensity of the attacks and in the general depression of the system.

Although some of the cases presented very grave symptoms the duration of the illness was 12 days from the beginning of the treatment. As is well known, the severe forms of the disease usually last a long time, and recovery does not take place until after many weeks, 30 to 40 days being the average duration, though sometimes they last for months.

The examination of blood from the beginning of our cases even in the apyrexial forms showed a marked leucocytosis, especially of the polymorphonuclear leucocytes. At the height of the illness the number of leucocytes reached 30,000–40,000 in most of our patients. On the other hand the number of the red corpuscles and the percentage of the hæmoglobin were diminished till the beginning of convalescence. During convalescence the leucocytosis decreased (10,000–8,000) while the red corpuscles and the percentage of hæmoglobin increased as the patient regained strength and the general condition improved.

The examination of the urine in most cases did not show anything abnormal. Only in two cases with high fever was there a slight albuminuria, which disappeared during convalescence.

Ten of the cases were mild and easily dealt with. The paroxysms were the only symptoms of the illness. The temperature was normal, the patient seemed rather out of sorts, and sleep was somewhat disturbed. The number of the paroxysms varied between 10 and 15 in the 24 hours. The number of the leucocytes was increased to 20,000–25,000. The urine was normal. In five other cases the disease was of moderate severity. The general health was more or less good. The temperature was normal except in two cases, in which it rose to 100·4° F. in the evening. The number of leucocytes was 20,000–35,000 at the height of the illness. The urine was normal.

I will now give a short description of some of the more severe cases :

Case 1.—Girl, aged 7 years. She was attacked with whooping-cough a week before we saw her. On August the 6th, 1921, she had 20–22 paroxysms in the 24 hours. Frequent vomiting. Conjunctivæ very hyperæmic. Eyelids swollen, temperature 100·4°–100·8°. Moist *râles* in the lungs. We prescribed intramuscular injections of ether in doses of 2 c.c. every other day. On the day before the application of the treatment the patient was very depressed, owing to the paroxysms being very severe and protracted and interfering with nourishment. After the first injection we remarked a little improvement in the number and the intensity of the paroxysms. After the sixth injection the paroxysms stopped, the bronchial symptoms disappeared and recovery took place.

Case 2.—Girl, aged 4 years, admitted August the 7th. During the first few days she had only 10 paroxysms in the 24 hours, but after a week they increased to 40. Her condition was aggravated by persistent vomiting. After a useless trial of the usual drugs (bromoform, chloral, quinine, and eucalyptus) we prescribed injections of ether, and after the second injection of 1½ c.c. the vomiting ceased, and the number of the spasms decreased to 30. The general health began to improve, the patient could take nourishment, and after the fifth injection the paroxysms ceased.

Case 3.—Girl, aged 12 years, admitted on August the 6th, 1921. Four days after admission she had 15–20 paroxysms in the 24 hours. She was given five injections in all,

consisting of 3 c.c. every two days. The paroxysms diminished after the first injection, fell to only half the number after the third, and entirely ceased after the fifth.

Case 4.—Girl, aged 5 years, admitted on August the 8th. The treatment began on the fourth day after admission, when she was having 12–15 paroxysms in the 24 hours and vomiting frequently. We prescribed injections of 2 c.c. of ether every two days. After the first injection the vomiting ceased. After the second the paroxysms were reduced by half. After the fourth they decreased to 2–3 only in the 24 hours, and ceased altogether after the sixth. The patient regained her strength and made a complete recovery.

Case 5.—Girl, aged 8 years, admitted on August the 7th. She had some characteristic paroxysms, especially at night, which after 2–3 days amounted to 40 in the 24 hours. Temperature 102·2°, repeated vomiting after the paroxysms, marked loss of flesh, incontinence of urine and sometimes of fæces during the paroxysms. On auscultation signs of slight broncho-pneumonia were found in the left lung. We prescribed injections of ether in doses of 2 c.c. every second day. After the third injection improvement was well marked.

Among the 5 severe cases two had bleeding from the nose and blood-stained expectoration, temperature 102·2°, nearly 40 paroxysms in the 24 hours, and rather severe bronchial symptoms. In two other cases there was incontinence of urine and fæces during the paroxysms, and prolapse of the anus.

One case presented conjunctival hæmorrhage and subcutaneous ecchymoses in the lower lid. All these cases were cured in 12–15 days by injections of 2 c.c. of ether every second day. The rapid recovery in all these cases was all the more remarkable, as the patients were poor working-class children of feeble constitution and poor organic resistance. The treatment by injections of ether was particularly valuable, as it succeeded in cutting short an epidemic in an institution where the ages of the inmates rendered them eminently susceptible to infection.

Royal Society of Medicine.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Friday, January the 26th, 1923.

The President, Dr. Eric Pritchard, *in the Chair.*

Cases showing late results of Encephalitis Lethargica.—(1) Dr. R. C. Jewesbury showed two cases. The first case was that of a boy, now aged 4 years. He was perfectly normal up to the end of his first year, when he had an indefinite febrile illness, during which he had progressive weakness of the limbs, and became unable to crawl, sit up, or even hold up his head. There was no history of fits. On admission to hospital at the age of 15 months he showed marked hypotonia, absence of reflexes, slight internal strabismus and inability to sit up unaided or hold up his head. He developed at times a tetany position of the hands. The cerebrospinal fluid appeared to

be quite normal and the Wassermann reaction was negative. The present condition was as follows: There was a remarkable spasticity of all the limbs; he was unable to stand or stoop. All the reflexes were exaggerated and there was a bilateral extensor plantar response. The most striking feature about the case was that in spite of the remarkably spastic condition the mentality was extraordinarily clear. The second case was that of a girl, aged 10 years. In 1918 she had what was thought to be an attack of meningitis, after which she lost power in the limbs, and was unable to speak for 5 months. She gradually recovered, but was left with a marked incoordination and ataxy; the muscular tone was increased. At that time the nervous system showed little abnormal. The plantar reflexes were flexor and the tendon-jerks were rather brisk, but there was nothing abnormal about the cranial nerves and the mental condition was good. At the present time she still showed distinct ataxy, though she could walk alone. She had an intention tremor of the hands, the speech was slow, and although at the time of her illness she was mentally very clear, she was now distinctly backward.

(2) Dr. H. C. Cameron showed four cases: (i) Girl, aged 6 years, admitted to hospital in 1917 for an acute illness with pyrexia and unconsciousness. Discharged to an infirmary 3 weeks later with measles. Discharged from the infirmary at the end of a month unable to speak, became babyish in her habits and for long took no notice of her mother. At times very restless and excited, and complained of severe pains in the head. Never had any difficulty in swallowing. Frequent attacks of hyperpnœa, breathing very noisy and face flushed. Had transient attacks of unconsciousness; fell down and bruised herself. Frequent nodding movements of head to and fro. Face a little stiff and blank at times. Outstretched arms and hands tended to be over-extended and show slight tremor. Tendon reflexes all increased. Equilibrium not very good; speech still difficult. On the whole she was improving. (ii) Boy, aged $6\frac{1}{2}$ years. Both he and his younger brother had "sleeping sickness" in 1918. Stupor for 10 days, and unable to walk for 2 months afterwards. Since then he had had frequent attacks of noisy hyperpnœa, lasting for 2 or 3 hours at night. Did not speak plainly. Walked well but easily tired. Equilibrium not very good. Behaved well, but not so sharp as his brother, who appeared to be quite unaffected. (iii) Boy, aged 5 years. At the age of $3\frac{1}{2}$ months admitted to hospital with a pyrexial attack and coma. The coma lasted 3 months. Diagnosed? botulism, ? encephalitis. Remained very ill and stuporose for about a year. Sat up at the age of $2\frac{1}{2}$ years, and had only walked without support for the last 6 months. Increased tendon reflexes in arms and legs, but much more so on left side. Left side of face also involved. Paralysis of palate and strabismus. Dribbled a great deal and regurgitated fluids. Very emotional, no reserve, took no notice of toys; did not feed himself. (iv) Boy, aged 16 months. For the last 7 months he had been subject to phases of restless excitement. Somnolence was not a prominent feature. At times there were attacks of hyperpnœa with loud noisy, breathing, flushed face and anxious expression. Then suddenly the breathing would cease altogether and a long apnœic pause of 30 or 40 seconds would ensue. In the longest attacks of apnœa the child became very cyanosed, unconscious and flaccid. Finally respiration would begin and he would cry as though frightened, while the cyanosis disappeared. The attacks occurred as a rule at night, but there were occasional attacks by day if he was excited or

emotional. In hospital they varied from 2 or 3 a day to 20 or more. On some days there was complete freedom. Physical examination showed nothing abnormal.

(3) Dr. F. J. Poynton showed 8 cases. He had had 14 in all, which were grouped in four classes. In the first group there were 3 cases, in which there was apparent recovery. In the second group were those who had recovered but still had some loss of control, such as emotionalism, kleptomania, or some other moral deliquency. In some there were severe headaches also. Such cases were very important from the point of view of forensic medicine. In the third group, in addition to mental impairment there were curious choreiform or athetoid movements which sometimes seemed almost epileptiform. The fourth group were those of the Parkinsonian type. The case shown was like one of advanced paralysis agitans ; there were tremor, rigidity, a toneless voice, slow speech, masked face, salivation, some increase in the reflexes, and great mental deterioration.

(4) Dr. E. A. Cockayne.—Girl, aged 12 years. In March, 1922, she had a severe attack of encephalitis lethargica with double ptosis, squint, left facial paresis, and loss of power in all four limbs. Cerebrospinal fluid sterile and with no increase of lymphocytes. During her stay in hospital she developed a rapid rhythmical twitching of the left side of the face, which still persisted. The rate became quicker when she was tired or asleep. She was bad tempered, irritable, and upset about trifles, and often went to sleep in school, whereas before her illness she had always been a placid child. Her face was gradually becoming more expressionless.

(5) Dr. C. P. Symonds showed a case which had been reported in the 'Journal of Neurology and Psychopathology,' 1921, p. 249. The mother stated that at first the boy became abnormally drowsy and that afterwards twitching movements developed, and he was admitted with the diagnosis of chorea to an infirmary, where he remained 6 months. After his discharge he had nocturnal restlessness, which lasted for about a year and then completely passed off and mental changes supervened, necessitating his being sent to a mental hospital, where he still remained. He had violent attacks of temper; when he was thwarted he lay down, kicked and used bad language.

(6) Dr. C. Worster-Drought showed a boy, aged 12 years, presenting a Parkinsonian syndrome, mainly unilateral, as a sequela of encephalitis lethargica.

Clinical Meeting at Great Ormond Street Hospital for Sick Children.

Friday, February the 23rd, 1923.

Congenital Syphilis.—Dr. J. H. Thursfield showed a male infant, aged 13 months, who had had iritis and keratitis at 11 weeks of age with consequent destruction of vision. Sir Jonathan Hutchinson had described this rare condition and pointed out that it was nearly always unilateral, and more often found in females than in males; his figures were 12 girls and 3 boys. The patient also had well-marked epiphysitis.

Acholuric Jaundice.—Dr. R. Hutchison showed a girl, aged 11 years, and a boy, aged 6 years, who had both had recurrent attacks of jaundice

with increased fragility of red blood-corpuscles and enlarged spleens. Splenectomy had been performed in both cases by Mr. Addison. Good recovery. No recurrence of attacks. Fragility of red corpuscles still remained.

Acholuric Jaundice.—Dr. Donald Paterson showed a girl, aged 9 years, with a large spleen and increased fragility of red corpuscles, in whom the jaundice was worse at times.

Congenital Stricture of Œsophagus.—Dr. R. Hutchison.—The patient was a boy, aged 3 years. Since he was 6 weeks old he had had attacks of vomiting and constipation about once a month. The attack lasted about 7 days and during this time everything was vomited. Between the attacks he usually vomited about once a day. Was always constipated. The vomit was bile-stained during the attacks. On admission to hospital the attack had lasted 19 days. Past history: Had never taken solid food; walked at the age of 1 year 9 months. Family history: Four healthy children, patient being the youngest. Was extremely constipated on admission and gave the picture of acidosis. Vomiting continued although the acidosis had been adequately treated. A bismuth meal revealed the stenosis of the œsophagus. The child wasted rapidly and died 6 weeks after admission.

Autopsy.—Stricture of œsophagus $1\frac{1}{2}$ in. below bifurcation of trachea. Œsophagus dilated above the stricture; probe could not be passed, water trickled slowly through. There was no sign of past inflammation or enlarged glands. The stricture was hard and symmetrical, like a small, hard, fibrous pylorus.

Progeria.—Dr. D. Paterson showed a boy, aged 8 years, in whom the condition had been present since birth. The father and mother were first cousins. There were four children in the family; the girls were unaffected, both boys were affected. The skin and facies presented a senile condition. The vessels showed arterio-sclerosis. There was almost complete absence of subcutaneous fat.

Congenital Syphilis.—Dr. D. Nabarro showed six cases in children aged from 17 months to 13 years. In four cases which had received forty injections of novarsenobenzol or more the Wassermann reaction was still + + + +.

Ankylosis of Jaw.—Mr. G. E. Waugh and Mr. A. T. Pitts.—The patient was a girl, aged 9 years, who had an abscess in front of the right ear when 8 months old and difficulty in opening the jaw since. In 1917, when 4 years old, gags were inserted under anæsthesia and props and wedges at night, with some improvement. In 1918–20 similar treatment. In 1921 could separate teeth only one-third of an inch. Forcible gagging under anæsthesia; props; gland abscess in neck opened. In May, 1922, Mr. Waugh excised right temporo-maxillary joint; no joint cavity found; condyle hewn out of solid mass of bone. The patient had now a good functional bite, which had not shown any tendency to lessen by fibrous contraction at the site of the operation.

Congenital Absence of Teeth in Three Members of a Family.—Mr. A. T. Pitts showed two boys, each with two peg-shaped teeth in the lower jaw, next to the canines, with a space between them. The mother

stated that there were no deciduous predecessors and that these teeth had not been lost, although the other permanent incisors had erupted. A twin brother of one of them, now dead, had had a similar condition. The abnormality consisted in an absence of both deciduous and permanent central incisors with an absence of the permanent lateral incisors. The deciduous lateral incisors were peg-shaped. Mr. Pitts said that absence of deciduous teeth was uncommon, although the opposite condition of supernumerary deciduous teeth was often seen. Peg-shaped teeth usually occurred in the upper lateral incisor region. The upper third molars were also frequently reduced in size, though less commonly absent. There was no evidence of inheritance in these cases.

Cases of "Hutchinsonian" Teeth.—Mr. A. T. Pitts.—The upper central incisors were peg-shaped and showed a marked narrowing towards the cutting edges. Wassermann reaction + + + +. It was a mistake to assume that a notch was invariably present in congenital syphilis, though this type undoubtedly presented the "Hutchinsonian" tooth in its most perfect form. In all cases the tooth showed a narrowing towards the cutting edge, and unless this was present the tooth should not be recognised as of the "Hutchinsonian" type. The cutting edge, however, showed a range of variation. In the least marked form the edge might be normal, and there was not any bevelling of the enamel adjacent to the cutting edge. In the next type there was a crescentic area of bevelled enamel just above the cutting edge, but the cutting edge showed no notching. The next type showed an actual notch in the centre of the cutting edge. In the next type there was a definite crescentic notch which represented the "Hutchinsonian" tooth as Hutchinson himself described it.

The sister of the patient was a typical case of congenital syphilis.

Congenital Absence of all Teeth but two.—Mr. Pitts.—Boy, aged $7\frac{1}{2}$ years. The only tooth seen was a molar in the left maxilla. X rays showed another molar in the right mandible. The boy was one of twins, the other dying at birth. Birth was premature and the child was delicate in infancy. He was very small for his age. The mandible had an obtuse angle like that of an edentulous person. The alveolar ridges and palate were very shallow. The hair was coarse and dry; the cheeks were somewhat scaly. A similar case had been shown by Dr. Cockayne (*v.* British Journal of Children's Diseases, 1921, xviii, p. 90). In all cases on record there seemed to have been associated abnormalities of other epithelial structures.

CLINICAL SECTION.

January the 12th, 1923.

Tumour Removed from the Brain of a Child, aged 12 years.—Mr. H. S. Souttar.—The tumour was an endothelioma which arose from the falx cerebri and was burrowing into the right frontal lobe. The child had been ill for 15 months, during which the chief features were attacks of frontal headache, vomiting and a sensation of numbness in the left leg, followed by twitching which spread up the leg, involving the left arm and face. The tumour was removed across the substance of the right frontal lobe, through which an incision had to be made, the skull having been

opened by means of an osteoplastic flap. She made a perfect recovery, the temporary paralysis of the left arm and leg clearing up in 10 days.

Case of Urticaria Pigmentosa. — Dr. J. M. H. MacLeod. — The eruption appeared first when the child was 3 months old. The case appeared to him to be rather an urticarial than a nævoid condition, and was possibly the result of sensitiveness to some foreign protein.

Case of Urticaria Pigmentosa.—Dr. J. A. Drake showed a case of typical urticaria pigmentosa in a baby, illustrating the turgescence of the lesions when irritated by clothing on movements. The condition was extremely irritable.

Trichorrhexis Nodosa.—Dr. J. L. Bunch showed a girl in whom all the hair had broken off at practically the same length. She had also nearly lost her eyebrows, *i.e.* the hair had broken off short. The mother said that unless the head was thoroughly washed at least three times a week, all the hair of the head became so matted together and arranged in bundles that the school authorities would not admit her to school. Strong soda and soaps had been used to get rid of the obvious pediculosis, and might have had something to do with the hair becoming brittle and breaking off short, but the trichorrhexis nodosa had been present for years, and the pediculosis was almost certainly of recent origin, or it would have been attended to by the school authorities.

Case for Diagnosis.—Dr. A. Whitfield.—The child was first brought to the out-patient department when a few weeks old, and the condition was most probably congenital. The salient features were then as follows: The child was very puny and small, but otherwise there was no evidence of ill-health. The cheeks were swollen, tense, and of a bright vermilion red with a polished surface. In the centre of the red area on the right cheek there was an oval white patch. On pressure the colour disappeared to a great extent, and revealed the fact that there was a certain amount of nævoid telangiectasis underlying the diffuse redness. The hands were intensely cyanotic and slightly swollen, but at that time no nævoid condition could be detected. Practically the whole of the gluteal region was in the same condition as that noted on the cheeks. The feet were not affected. Owing to the cyanosis and the general condition small doses of thyroid were given and a marked change took place. The cyanosis disappeared and the general condition improved. The cheeks lost the swelling and tension but the nævoid condition became more evident. The hands had ceased to be blue, but had showed a nævoid condition which extended up the wrists and was apparently dying down slightly, leaving some pigmentation. The buttocks had undergone the same changes as the face and the feet and ankles had become affected, and their condition now resembled that of the hands and wrists. Dr. Whitfield had never seen a similar case, and wondered whether it was an anomalous case of erythrœdema or the "pink disease." On the whole he was more inclined to view it as a unique case and believed that the symptoms would eventually die away.

February the 9th, 1923.

Hirschsprung's Disease: Partial Relief following Plication of the Sigmoid Flexure.—Mr. W. G. Spencer.—The patient was a boy, now

aged 7½ years, the seventh child, born at full term, weighing 9 lb., was breast-fed for 10 months and progressed until a year old. Wasting ensued. After measles at the age of 3 he developed blood-stained, loose motions, rectal prolapse and undue distension of the abdomen with a poor appetite. He was first admitted to hospital for medical treatment at the age of 4½ years, with other characteristics of the disease; his weight was 27 lb. and his girth at the umbilicus 22 in. By X-ray examination it was noted that delay in the movement of the intestinal contents commenced in the first part of the ascending colon. Under medical treatment the rectal prolapse ceased and his weight increased to 31½ lb. After discharge he relapsed and was readmitted six weeks later. Following a second period of temporary relief under medical treatment there was a further relapse. He was readmitted on the third occasion for surgical treatment owing to signs of subacute intestinal obstruction, including vomiting. He weighed 29 lb. and his abdominal girth was 21 in. On May the 21st an abdominal incision exposed somewhat distended but otherwise normal small intestines. These being collected and swung over to the right, there was exposed a greatly dilated and enlarged sigmoid loop, twisted half a turn on itself and occupying the right epigastric region under the liver. The wall was much thickened, starting from the junction within the rectum; the thickening of the wall and the dilatation of the lumen continued in a diminishing degree throughout the descending and transverse colon, but there was no marked elongation along the sigmoid flexure. In addition to the great dilatation and thickening of its wall, the sigmoid loop appeared about three times its normal length. The application of sutures reduced its dilatation and elongation until the general appearance resembled that of a sausage. During the operation there was a small rapid pulse, shallow respiration and dilatation of the pupils, countered by keeping the head low and by saline infusions. Two months after the operation, under daily massage he could take a full diet and his motions were regular. His weight had increased to 40 lb., the abdominal girth being still 21 in. He had now been under his mother's care at home for 18 months. He continued stunted in growth, was pale and thin, had a poor appetite. He had two or three loose motions in the morning and one again at night; the abdominal girth was about the same; weight was 35 lb. The rectal prolapse and vomiting had not recurred. Improvement in weight and regularity of motions would doubtless follow readmission and treatment adapted to his individual requirements. This would be an essential preliminary, if the only medical treatment, that of excision as performed by Arbuthnot Lane, were to be recommended.

Postscript.—March the 23rd, 1923: After a further treatment in hospital the boy's weight had increase to 40 lb., and he had generally only one formed motion daily.

SECTION OF DERMATOLOGY.

February the 15th, 1923.

Case for Diagnosis.—Dr. A. Winkelreid Williams showed a boy, aged 13 years, with no drug history, no evidence of food poisoning, and no history of any sore on the body for the last twelve months. He had been sent back from school three weeks before with what appeared to be varicella. The eruption had begun like varicella on the chest and abdomen, where it was now

fading and in some places was gone. It spread centrifugally, the last parts attacked being the soles and palms, and it was now beginning to break out on the face and buccal membrane. The vesicles capped red papules or macules; they dried up in a day or two leaving a thin scale, which peeled off, and left a bluish-red papule or macule showing through the diascope a brownish pigmentation. The rash was thickly studded over the whole body, and was slightly purpuric about the axillæ and lower limbs. Some glands were hard and enlarged. The Wassermann reaction was negative. A differential blood-count showed no abnormality.

March the 15th, 1923.

Folliculitis Ulerythematosa Reticulata.—Dr. E. G. Graham Little.—The patient was a boy, aged 5 years, who at present showed little more than the superficial pitting characteristic of terminal stages of the disease. Dr. MacKenna, who had seen the child when he was 19 months old, had diagnosed the case as an unusual variety of follicular hyperkeratosis with slight peri-follicular erythema. Several of the follicular orifices showed spiny central projections, but no suppuration. There were no subjective symptoms. Dr. Little said that there had been very few cases of the disease. As there were very few symptoms, probably a number of cases had been overlooked. All the cases had been in young children, a slight majority in males. There was a history of tubercle in a small majority of the cases.

In the subsequent discussion, Dr. G. Pernet said he had recorded a similar case which he had called atrophodermia reticulata symmetrica faciei (see British Journal of Children's Diseases, 1917, xiv, p. 213).

Abnormal Scarring after Chickenpox.—Dr. R. Travers Smith.—The patient was a boy, aged 14 years. He had scars, some the size of a threepenny-piece, some larger, on the abdomen and back. When 16 months old he had chickenpox. The lesions took a long time to heal.

In the subsequent discussion Dr. Whitfield and Dr. Dore suggested that the scars were probably due to gangrenous chickenpox.

EPIDEMIOLOGICAL SECTION.

November 24th, 1922.

The Age and Sex Distribution in Scarlet Fever.—Dr. F. M. Turner stated that curves showing the age-incidence of scarlet fever in London and elsewhere had been published in great numbers. The curves resembled each other very closely, so that one's first impression was that the differences were due to chance. On calculation, however, these differences, though small, were greater than could be explained thus. The mean age in the two sexes differed from half to one year or more. The difference tended to increase in the later years. The mean age of cases notified was higher than that of cases admitted. The cause of the difference was obscure. A comparison of the mean age of cases in each year with the prevalence of scarlet fever showed that there was a strong tendency for both to rise together in seven-year periods. Thus the mean age showed maxima in 1887, 1893, 1900, 1908 or 1909, 1914 and 1921. Maximum prevalence occurred in

1887, 1893, 1907, 1914 and 1921. On the other hand, a minimum prevalence occurred in 1900. Probably it was owing to this that no correlation could be shown from the figures available.

The Relationship between Rainfall and Scarlet Fever.—Dr. J. Brownlee referred to Longstaff's paper read before the Epidemiological Society in April, 1880, in which he showed that from 1855–1875 a close relationship appeared to exist between the amount of rainfall and the prevalence of scarlet fever, wet years being associated with less scarlet fever and dry years with more. From 1875 to 1880 the association was less marked. Dr. Brownlee had investigated the relationship between rainfall and scarlet fever in London, Birmingham, Manchester, Liverpool, Newcastle-on-Tyne, Glasgow and Edinburgh, and had come to the conclusion that if the conditions were suitable for an epidemic a dry year would tend to increase its size and a wet year to diminish it. There was, however, no satisfactory statistical method of dealing with such an association.

SECTION OF LARYNGOLOGY.

March the 2nd, 1923.

Laryngostomy for Complete Subglottic Stenosis.—Mr. W. Howarth showed a boy, aged 12 years, who had worn a tracheotomy tube cover since a high tracheotomy for diphtheria in early life. The cricoid cartilage had been divided and had fallen in. Operation, 1913: laryngo-tracheostomy. The gutter into which the lower part of the larynx and the upper part of the trachea was converted was kept open for many months by the use of a large rubber tube, on to the back of which a sheet of oiled silk was sewn. The cavity was packed daily on to this, and eventually the epithelium growing in from the surface covered the whole area. The epithelialised groove was then covered in by a plastic operation. The war intervened before the final operation, and the patient was lost sight of until a few months ago.

SECTION OF MEDICINE.

April the 24th, 1923.

Glandular Fever and Infective Mononucleosis.—Dr. H. Letheby Tidy stated that glandular fever was an acute infectious disease, principally of childhood, and was characterised by marked and rapid enlargement of the cervical glands and by a less constant enlargement of the spleen and other glands. The cervical glands might be slightly tender, but were not acutely painful. The changes in the fauces were slight compared with the marked glandular enlargement. The temperature rose with the glandular enlargement to 103° or even 105° F. for a few days. The only definite complication was hæmorrhagic nephritis. Suppuration was very rare. Convalescence was usually slow, but recovery was finally complete and the mortality was negligible. The condition had no relation to mumps, whooping-cough or other diseases. The condition was identical with infective mononucleosis, and an absolute lymphocytosis in which the per-

centage might rise to 95 was a normal but not invariable occurrence. In an epidemic of glandular fever in a boys' school, 24 out of 30 boys had definite attacks. The epidemic was mild, but many of the cases were typical. The blood was examined in 18 cases. It was found that lymphocytosis might take time to develop and might be very transient. It was not invariable, for in one case in which suppuration was feared polymorphonuclear leucocytosis was present.

SECTION OF NEUROLOGY.

November the 9th, 1922.

Case of Tremor for Diagnosis.—Dr. A. Feiling showed a girl, aged $10\frac{1}{2}$ years, who had been brought to hospital for involuntary movements of the left side of the body. She was a full-time child, a breech presentation, and at birth had white asphyxia. Sat at the age of 18 months, walked at 3 years. Had never had fits. No illnesses except measles. At age of 9 months involuntary movements were noticed on the left side of the body with weakness in holding up the head. During the last 5 months these movements had become worse and had extended to the other side of the body. At times her voice became very weak. No history of any nervous disease in the family. The child was well grown and appeared quite intelligent. There was slight weakness in the lower part of the face, and the tongue was deviated slightly to the left. The left arm was the seat of a rhythmical tremor, more marked in the proximal part of the limb. The movements produced rotation of the arm at the shoulder, pronation and supination of the forearm at the elbow, and flexion and extension of the fingers. The rate was about two to the second. Both arms were hypertonic. Similar movements affected both the trunk and the legs, though to a less extent. In the legs again the proximal muscles were involved to a greater extent than the distal. There was no actual paralysis, though the power of the left arm and leg was less than on the right side. The deep reflexes were present; the plantar reflexes were flexor. The Wassermann reaction in the blood was negative and the cerebro-spinal fluid showed no abnormality.

Complete Amaurosis, Dementia and Spastic Paralysis in a Hebrew Boy, aged 10 years.—Dr. George Riddoch.—Family history: Father and mother first cousins. No history of nervous troubles in relatives on either side of the family. Three children: (1) boy, aged 12 years, normal; (2) patient; (3) girl, aged 7 years, normal. Previous history: Birth at full term; normal labour. Breast-fed until 18 months old. Began to walk at 9 months. Could say "Mammy" and "Daddy" at 12 months. Measles in second year. Apparently bright and intelligent child until the age of 4. Present illness: At the age of 4 progressive weakness of lower limbs. At 6 years weakness of upper limbs and defective speech first noticed. Mental deterioration, destructiveness and screaming fits. After an attack of influenza disabilities rapidly increased. At the age of 8 years it became evident that he could not see well. Completely helpless; incontinent; had to be fed. Fits were frequent, and there was complete constipation. Present condition: complete dementia, blindness and spastic paralysis, upper limbs in flexion, lower limbs in extension. Lay on his back

with head to one side and saliva dribbling from his open mouth. Quick involuntary flexor movements, especially of the upper limbs, occurred frequently. These myoclonic movements could be evoked by the slightest tap on any part of the body, and sometimes by a loud noise. They were often bilateral and symmetrical, and were then accompanied by movements of the head and face, contraction of the muscles of the trunk and a grinding noise. All tendon reflexes were much increased, and the plantar response was flexor on both sides. Bilateral optic atrophy with much pigmentation of the retina. No cherry-red spot in the position of the macula was seen on either side. The Wassermann reaction in the blood was doubtfully positive.

January the 11th, 1923.

Case of Syringomyelia.—Dr. S. A. Kinnier Wilson.—The patient was a girl, aged 16 years. Previous history: diphtheria, "rheumatism" at the age of 4 and frequently since in legs, arms and shoulders. Operation for adenoids at 10. Twelve months' history of painless sores on the right hand and fingers.

On November the 12th, 1922, she experienced a feeling of coldness in the right half of the body. At the same time she noticed that she could not appreciate the temperature of water with the right arm or hand, and that the left pupil was getting smaller and the left eyelid drooping. On admission in December, 1922, the left pupil was smaller than the right, and the left eyelid was drooping. There was slight impairment of tactile sensibility, and marked thermal and pain loss in left trigeminal area. Tongue in protrusion deviated slightly to the left. Very slight spasticity of right arm and leg. Right leg weaker than left. Sensory loss to pin-prick and temperature over right half of body up to a transverse line in mid-cervical region. Faint diminution to tactile stimuli over the same area. Knee- and ankle-jerks greater on right than on left side. Right plantar reflexes doubtful, left flexor sphincters unaffected.

Case for Diagnosis, possibly Amyotonia Congenita.—Dr. S. A. K. Wilson.—The patient was a boy, aged 11 years. Born normally; began to walk at normal age. Second youngest of eight children. At the age of 4 he was noticed by his mother to be double-jointed. He began at this time to "fall about." The weakness of the legs had been progressive in the last three years. At present he was unable to stand unsupported. Mentally he was bright and intelligent. When sitting up the back was unduly rounded. The arms were thin and their strength poor. The muscular power of the legs was very poor. Impaired muscle tone in all limbs, the deficiency being greater in the legs than in the arms, over-extension at the knees or passive movements being very prominent. No contractions present. Arm-jerks very feeble. Abdominal reflexes active. Knee-jerks: right greater than left, which was feeble. Ankle-jerks: right feeble, left not obtained. Plantars: right indefinite, left flexor. Sphincters unaffected.

Congenital Neuro-syphilis in Brother and Sister.—Dr. S. A. K. Wilson.—Case 1: Boy, aged 10 years. Epileptiform fits since 5. Automatism, spitefulness. Mentally clear. Hutchinson's teeth. Pupils unequal, poor light reaction. Wassermann reaction in blood negative.

Case 2: Girl, aged 7 years. At the age of 5, paraplegia; unable to walk

since arrest of mental development. Argyll-Robertson pupils. Knee-jerks increased, plantars extensor, gait spastic, stamping. Ocular fundi: disseminated sclerosis. Wassermann reaction in blood positive.

SECTION OF ODONTOLOGY.

March the 26th, 1923.

Case of Multiple Dentigerous Cysts.—Mr. Bernard Grellier.—When seen in May, 1922, the patient, a boy, aged 13 years, presented multiple cysts involving the maxilla and mandible. The face showed marked swelling on both sides in the region of the malar prominences and a slight fulness on the right side over the mandible. The swelling on the left side had been observed 18 months previously, and had increased since then. Otherwise nothing had been noticed and no pain had been felt till about a fortnight before he attended hospital, when a throbbing pain was felt on the right side of the maxilla, followed in a day or two by a discharge into the mouth. He looked anæmic and somewhat delicate, but did not complain of ill-health. His past history had been that at birth there had been some inflammation of the eye. When 1 year old he suffered from meningitis, pneumonia, and an inguinal hernia; when 3 years old he had had measles and whooping-cough, and when aged 11 years he was attacked with broncho-pneumonia following influenza. His tonsils and adenoids had been removed. The eruption of teeth had been delayed till he was nearly 2 years old. There was no other dental history and there was no family history. On examination it was found that the teeth present were the permanent upper and lower incisors, all the deciduous canines, the first and second deciduous molars, and the four permanent first molars. The tip of the left second upper premolar was just showing on the outer side of the alveolus above the second deciduous molar. All the deciduous molars were badly diseased – in fact only the roots remained, except in two of them. The other teeth were healthy. In each region of the diseased deciduous molars there was a swelling. The left upper swelling was the largest, and extended from the midline to the first permanent molar on the outer side of the alveolus, passing high into the buccal sulcus. Over its most prominent part it fluctuated and it also yielded the so-called eggshell crackling sensation. There was some corresponding swelling in the palate, but it was not so extensive. There was no sign of inflammation. The right upper swelling was similar but not so large. On the outer side there was a sinus discharging pus. In the left mandible there was a slight bulging of the outer alveolar plate, and two hard nodular swellings on the inner side, which were probably the two unerupted premolars forced inwards by the cyst. On the right side of the mandible the swelling extended from the deciduous canine to the first molar, and fluctuation could be felt on the outer side. In removing each cyst the portion of tissue holding the deciduous molars was dissected away attached to the cyst without disturbing the relation of the deciduous teeth with the cysts. In the cysts of the mandible no tooth was found, and the premolars could not be seen in the cavities left by removal of the cysts. In the right upper cyst the second premolar was removed with the cyst, and was lying loosely in it. It was well developed, except for the upper part of the root. In the case of the left upper cyst both premolars were removed

with the cyst, but the second premolar had been drawn inwards during the operation. The course of healing was uneventful. Deep cavities resulted from the operations, but they were diminishing in size. About a month after the cyst on the left side of the maxilla was removed the canine formed a swelling in the anterior wall of the cavity and later erupted into it. In the mandible the premolars were just erupting after two months, and in the maxilla on the right side the tip of the first premolar was showing in the cavity.

SECTION OF ORTHOPÆDICS.

November the 7th, 1922.

Ischæmic Paralysis.—Mr. H. A. T. Fairbank showed a boy, aged 9 years, who had sustained a fracture of the lower end of the right humerus in December, 1921. No history of the treatment then received was available. He was admitted to the hospital in January, 1922, with typical ischæmic contracture of the right forearm. There was flexion of the wrist and interphalangeal joints with some hyperextension of the metacarpo-phalangeal joints, all of which were stiff with only a small range of painful movement. The long flexors of the hand were just acting but there was no power in the interossei. The general nutrition of the hand was very defective and the skin purple. Sensation to cotton-wool was lost over the whole hand on both aspects and to pin-prick over the same area, except over the hypothenar eminence and the ulnar side of the dorsum. Skiagrams showed an old supra-condylar fracture in very bad position.

Only 10° of movement, from 90° to 100°, were possible at the elbow-joint; there was a scar apparently from a deep pressure-sore on the anterior aspect of the forearm. Treatment by gradual stretching and physio-therapy had produced considerable improvement, but there was still anæsthesia in part of the median nerve distribution, and the median intrinsics remained almost completely paralysed, while movements at all the joints were defective, and there was only slight power in the long flexors.

Fracture of the Small Trochanter.—Dr. W. T. Gordon Pugh showed skiagrams of a boy, aged 14 years, who had previously been under treatment for acute osteomyelitis of the lower ends of both femora and of the right tibia, from which he made a good recovery. He was discharged with good movement. In July, 1921, three months after discharge, he was readmitted to hospital with a history that while running and in the act of lifting the left thigh he heard a crack and felt a severe pain in the inner side of the left groin. There was no deformity or shortening, but all thigh movements were limited and slightly painful. X rays showed a fracture of the lesser trochanter, which united in the displaced position after treatment by flexing the knees over pillows. When last seen four months later there was full movement.

Osteo-chondritis of the Hip.—Mr. D. M. Aitken showed skiagrams of three different stages of this disease in three members of the same family—a boy aged 7 years and girls aged 13 and 20 years. In addition to the hip condition the younger girl had slight luxation forwards of the upper ends of both radii, and the elder girl had developed considerable limitation of

movement of both radii associated with luxation of the heads of the radii and scoliosis. Her X-ray plates showed arthritic changes of the head of the femur in addition to some mushrooming.

Tendon Transplantation for Talipes.—Mr. E. Laming Evans showed a girl, aged 9 years, in whom he had performed tendon transplantation for paralytic talipes equino-varus. Treatment by manipulations and instruments having failed he had transplanted the tibialis anticus tendon to the base of the fifth metatarsal with a satisfactory functional result.

December the 5th, 1922.

Case of Multiple Exostosis.—Mr. Acton Davis showed a boy, aged 11 years, with the upper two-thirds of the humerus involved by a tumour, 26 in. in girth and 7 in. in length, first noticed at age of 3, girth increasing by 1 in. yearly. Other swellings affected both ends of femora, lower end of right radius, both scapulæ, both ends of tibiæ, and lower end of left fibula. Two brothers, two uncles, one aunt and grandfather had exostoses.

SECTION OF UROLOGY.

January the 25th, 1923.

Absent Right Kidney; Deformity of Left Ureter.—Mr. W. Girling Ball.—The patient was a boy, aged 9 years, who was suddenly taken ill with abdominal pain and vomiting. A sausage-shaped swelling was found on the left side of the abdomen, extending from under the ribs to the level of the pelvic brim. There were no urinary symptoms. On exploration the swelling proved to be an enormously distended left ureter, which was opened extraperitoneally and found to be connected with a distinctly hydronephrotic kidney; the cause of the dilatation could not be discovered. The hole in the ureter was sewn up. The boy remained well for a fortnight, when the ureter again filled up, but on this occasion emptied itself into the bladder on application of hot fomentations to the abdomen. A week later it filled up again and discharged itself through the lumbar incision. Occasionally after this the boy passed water by the bladder, and the fistula closed, but when there was leakage through the fistula he did not pass any water from the bladder at all. Cystoscopy showed marked twisting of the left ureteric orifice and absence of an orifice on the right side. Repeated X-ray examinations failed to show the presence of a left ureteric calculus or the presence of either kidney. The injection of dyes failed to demonstrate the presence of a right ureteric orifice. On operation no evidence of a right kidney or ureter was found. The left kidney was large and cystic. The bladder was drawn out of the pelvis and the peritoneum pushed up, and the distended ureter traced down to its point of insertion into the bladder. The last inch of the ureter was unusual in calibre, and from that point upwards the dilatation commenced without obvious cause. The normal portion of the ureter was divided between ligatures. The upper portion was freed and divided above the point of narrowing and implanted into the bladder at a point higher up its wall. The bladder was drained suprapubically. The wound rapidly healed, and the boy had remained well since.

Glandular Epispadias.—Mr. J. Swift Joly, who showed two cases, said that glandular or balanitic epispadias was the most uncommon form of this condition. Katzenstein, in 1904, has collected only five cases from the literature, and Mr. Joly did not know of any others since reported. His first case was in a well-developed boy, aged 12 years. At first sight the external genitals appeared normal, except that the penis was slightly stunted. The prepuce was long, and in its normal condition entirely hid the defect. When it was fully retracted it was seen that the urethra opened on the dorsal surface of the penis, immediately behind the corona glandis. A deep groove extended from this point to the usual position of the external meatus. It involved the whole thickness of the corona, but in front it extended only about half way through the glans. Its greatest depth was 6 mm. The groove was lined with mucous membrane, which was of a much deeper pink that the epithelial covering of the glans. There was no stricture. On perinæal and rectal examination the course of the urethra appeared to be normal. The testes were well descended, but rather small. The pelvic girdle appeared to be normal, but no X-ray examination was made. As the boy suffered no inconvenience from the defect no operation was advised. The second case was in a well-developed boy, aged 7 years. At birth the penis was attached to the abdominal wall by a thin web involving only the skin, which was divided when he was 11 months old. Four years later he began to suffer from diurnal incontinence, which gradually got worse. On examination the penis was found to be small and stunted, the prepuce long and voluminous. A vertical scar was seen immediately in front of the pubis and another on the dorsal aspect of the prepuce. When the prepuce was fully retracted a rather stenosed urethral opening was seen in the middle line, immediately behind the corona. From this a very deep groove extended forwards, involving the whole thickness of the glans and lined with pink mucous membrane, which formed a distinct ridge on each lateral wall. The patient had a very tight stricture of the penile urethra about 1 cm. behind the abdominal orifice, which was fully dilated under general anæsthesia. The testes were only partially descended and lay a short distance below the corresponding external rings. There was a small hernia on the right side. The pelvic girdle was normal. The incontinence was due to the stricture, and disappeared as soon as it was dilated.

Société de Pédiatrie, Paris.

November the 21st, 1922.

Congenital Hemihypertrophy.—M. Lance, commenting on the case shown at the last meeting by MM. Babonneix and Buizard, referred to two cases which he had seen in which the hypertrophy was on the left side. In both cases the hypertrophy was associated with vascular nævi or pigmentation, without which it would have been impossible to say whether the left side was hypertrophied or the right atrophied.

Chronic Tuberculous Rheumatism.—MM. P. Harvier and Lebée showed a boy, aged 15½ years, who at the age of 10 had been attacked by rheumatic pains in the hips, knees and left elbow. After an interval of

about a year he was put in plaster for hip disease for six months, during which the lesions became generalised. There was at present a partial ankylosis of the shoulders, complete anklyosis of the elbows, wrists, hips, knees and ankles, cervical and dorso-lumbar spondylosis and deformities of the hands and feet. The process was probably tuberculous owing to the familial antecedent tuberculous appearance of the patient, mediastinal adenopathy and the positive cuti-reaction.

Congenital Dystrophies of Limbs.—MM. Harvier and Lebée also showed a boy, aged 9 years, who presented the following malformations: absence of patellæ, amyotrophy of leg muscles, probable absence of peronei, pes varus, atrophy and hypo-excitability of bronchial triceps, backward subluxation of the head of the right radius and atrophy of the nails of the hands. All these malformations except the dislocation of the head of the radius, which was difficult to explain, appeared to be due to neuro-muscular changes caused by parental alcoholism.

Case of Lipodystrophia.—M. L. Tixier, after referring to Parkes Weber's paper (*v.* British Journal of Children's Diseases, 1917, xiv, p. 81), described the first case to be recorded in French literature in a child. The patient was a girl who after a severe attack of influenza at the age of 7 years developed considerable disturbance of nutrition, characterised by almost complete disappearance of the subcutaneous cellular tissue and accompanied by complete anorexia and change of character, the child becoming very excitable and irritable. Visceral examination was negative.

Macroglossia from Chronic Phlegmonous Glossitis.—M. J. Miadier showed a boy, aged 4 years, with considerable and persistent swelling of the tongue interfering with speech and deglutition, and keeping the mouth permanently open. At the age of 18 months he fell and bit his tongue, which since that time increased rapidly in size. On examination the tongue protruded from 3–4 cm. beyond the dental arch and was enormously enlarged in all its dimensions, and not only widened the dental arch but distended the labial orifice; the protruded portion was dry and shiny as if varnished. The intra-buccal part was difficult to see, but was covered with a foul-smelling yellow fur and had superficial ulcerations caused by the teeth. It was of a uniform firm consistence. The anterior third was amputated; there was no pus. After recovery from the operation the boy's condition was satisfactory, but during an attack of hæmaturia with fever the tongue swelled up to a larger extent than before. Half the tongue was then amputated but the hæmaturia persisted, the lingual suture suppurated and the boy's condition became very bad, with enlargement of the submaxillary glands, the blood showing slight increase in mononuclears and eosinophiles. Finally complete recovery ensued at the end of two months when the tongue presented an almost normal appearance.

Tuberculous Heredo-Dystrophy of Paternal Origin.—M. G. Schreiber recorded two cases. The first was a female infant, aged 4 weeks, who was born with considerable kypho-scoliosis extending from the third to the eighth dorsal vertebræ with a convexity to the right. Three months after birth she developed convulsions. This combination of symptoms suggested the possibility of congenital rickets, but X rays showed a malformation of the seventh dorsal vertebræ. The Wassermann and cuti-

reactions were negative, but the father was suffering from severe pulmonary tuberculosis when he was married. The second case was a girl, aged 14 months, who at first sight appeared to be suffering from rickets owing to the shape of her skull and attacks of laryngo-spasm. Nine months before the birth of the child the father had been operated on for a tuberculous testis. M. Schreiber's conclusions were as follows: (1) Tuberculous infection was not hereditary, but tuberculous dystrophy might be. Even when the child was not infected by tubercle bacilli it might be weakly and dystrophic; (2) malformations and dystrophies were more frequent in children of a tuberculous stock than in children of healthy parents, and were more likely to develop when the parents were suffering from a severe form of tuberculosis; (3) tuberculosis might be a cause of rickets, not only directly but indirectly, by producing hereditary dystrophy; (4) early rickets, which was very difficult to explain, if improper feeding were regarded as the only cause of rickets, was not merely due to infections or intoxications of the fœtus during the last months of pregnancy, but might result from defective fecundation.

Relapsing Heredo-Syphilitic Hydrarthrosis.—MM. P. Merklen and M. Mirvielle showed a girl, aged 14 years, who had her first attack of hydrarthrosis of the right knee at the age of 4, when the condition was mistaken for tuberculous hydrarthrosis, and she remained for four years at Berck, where the knee was placed in various plaster apparatuses. A second attack occurred at the age of 11, when the knee was treated by punctures, and a third attack at 14, when complete recovery took place under treatment with intra-muscular injections of sulpharsenol and mercurial injection. Except during the second attack, when the wrists were affected, the other joints were not involved.

Cerebral Diplegia of Abnormal Type.—MM. Babonneix and Lamy showed a man, aged 20 years, with spastic paraplegia, dating from the first years of life, accompanied by mental impairment, malformation of the feet similar to that found in Friedreich's disease, and scanning speech. The patient thus presented a combination of the signs of cerebral diplegia, disseminated sclerosis and Friedreich's disease.

Congenital Dislocation of the Patella.—M. Lance showed the skiagram of a child, aged 4 months, with congenital dislocation of the right patella. Outward deviation of the knee was noticed at birth. At present the knee was semi-flexed with a genu valgum of 150°. There was an extraordinary degree of lateral movement; by an effort the tibia could be made to form a right angle with the femur. On the other hand, the leg could not be completely extended, but there always remained 20-25° of flexion. There was no abnormality in the development of the quadriceps, but there was an almost complete absence of the external condyle of the femur.

Heliotherapy for Weakly Children.—MM. Guinon, L. Ribadeau-Dumas and Vincent recorded six cases of weakly children suffering from tuberculosis or convalescent from broncho-pneumonia, who derived considerable benefit from heliotherapy. The time of exposure did not as a rule exceed four hours—two in the morning and two in the afternoon—viz. 9 a.m. to 11 a.m., and 4 p.m. to 6 p.m.

Zoster and Varicella.—M. L. Ribadeau-Dumas reported the history of a family of four children, aged from 3 to 10 years, consisting of two boys and two girls. On June the 12th the eldest girl developed typical lumbo-crural zoster. On July the 2nd her younger sister had an ordinary attack of varicella. The other two children, who were separated from their sisters, did not contract zoster or varicella. The girl who had had zoster did not contract varicella. Although the two sisters continued to share the same room, no external source of infection could be discovered.

Zoster and Varicella.—M. A. Netter reported nine cases which had been communicated to him within the last five months by various French practitioners, tending to show the varicellar nature of a certain number of cases of zoster.

Zoster and Varicella.—Mlle. Condat reported the history of a family of five children in which a case of zoster of the thigh in a child who had had varicella nine years previously was followed by three cases of varicella in other members of the family. The occurrence of varicella, however, was merely a coincidence, as in one child it appeared too soon (ten days after the onset of zoster), and in the other two too late (seventeen days after the onset of zoster), whereas the normal incubation period of varicella is fourteen days. The infection was in all probability contracted outside the family.

December the 9th, 1922.

Congenital Cranial Dystrophy.—M. G. Blechmann showed two infants with a special type of congenital cranial dystrophy, which he designated exophthalmic homalopsis (flat face). The malformation was probably of heredo-syphilitic origin, and was due to congenital narrowing of the orbital cavity. Its principal features consisted in a very marked flattening of the face with a falling-in of the root of the nose, excessive deformity of the palate and exophthalmos dating from birth. The syndrome was accompanied by mental deficiency, delay in walking and dentition, and paretic symptoms.

Relations between Zoster and Varicella.—M. J. Hallé reported the case of a woman with typical ophthalmic zoster whose grandchild, whom she was attending during the mother's confinement, developed varicella fourteen days later.

Further Examples of the Relations between Zoster and Varicella.—MM. A. Netter and M. Mozer reported the history of two children who developed varicella seventeen days after admission to the ward of a child suffering from intercostal zoster. The latter had come from a ward in which there had been an outbreak of varicella.

Persistent Vaginal Hydroceles in the Newborn and Hereditary Syphilis.—MM. G. Salès and P. Vallery-Radot, who related nine illustrative cases, stated that while bilateral hydroceles which disappeared in two or three weeks were remarkably common in normal infants, hydroceles lasting for some months, and almost always unilateral, were most frequent in unhealthy children presenting symptoms suggesting hereditary syphilis.

Although the Wassermann and Hecht reactions were constantly negative, the condition of the testis, which was found to be small and hard after removal of the fluid, was confirmatory evidence of syphilis in a child with other suggestive signs such as cranial deformity, dilated cranial veins, large spleen, pallor, etc.

Permanent Tetaniform Condition in the Newborn following Vaccination.—MM. G. Salès and P. Vallery-Radot, who reported this case, stated that large ulcerative vaccination lesions were liable to produce a neurotropic virus which was capable of causing a permanent generalised contracture. To prevent this occurrence small scarifications should be made at least 3–4 cm. apart, and should not be inoculated with too much lymph.

Otitis in Infancy.—M. H. Abrand emphasised the frequency of otitis in infancy. Latent otitis was liable to occur under three conditions: (1) at the onset and towards the end of eruptive fevers; (2) in influenza; (3) in gastro-intestinal infections. The ears should be systematically examined in infantile convulsions and in all cases with meningeal symptoms.

Double Club-foot with Congenital Dislocation of the Hip.—M. Roederer showed a girl, aged 8 years, with double club-foot and congenital dislocation of the hip on the right side. In spite of treatment for a year the adduction, supination and equinism were extreme.

Congenital Scoliosis.—M. Roederer also showed two cases of congenital scoliosis due to absence of one half of a vertebra. Case 1: Girl, aged 18 months, with slight paramedian gibbosity in the lower dorsal region without any trace of telangiectasis or pigment spots. X rays showed that the right half of the ninth dorsal vertebra was incompletely developed, while the eleventh had a supplementary bony nucleus on the right. There were twelve ribs on the right side and only eleven on the left. Case 2: Boy, aged 5 years. The second dorsal vertebra was rudimentary, and had a rib on the right side only; the left half was absent. The sixth dorsal vertebra rested on the left side on the eighth dorsal. There were no other vertebral anomalies.

Cranioplasty in a Child aged $2\frac{1}{2}$ years with an Osteo-periosteal Graft from the Mother.—MM. H. L. Rocher and C. Lasserre, of Bordeaux.—Delagenière's technique was employed, with completely successful results.

Arrested Growth of Tibia after Generalised Polyarthritis.—M. A. Trèves showed a girl, aged 13 years, who, after generalised polyarthritis of unknown nature at the age of 2 years, developed an arrest of growth in the upper epiphysis of the right tibia, so that the right lower limb was 4·5 cm. shorter than the left.

Infantile Paralysis with Spastic Phenomena.—MM. P. Nobécourt and R. Mathieu showed a male infant, aged 29 months, with paraplegia of sudden onset which presented the following remarkable features: flaccidity and complete reaction of degeneration in the muscles on the left side, while on the right there was no reaction of degeneration apart from

the rectus femoris and tibialis anticus, but a spastic condition consisting in a permanent muscular contracture with extension of the great toe and fan sign. There was no ankle or patellar clonus, nor any marked exaggeration of the reflexes.

Abnormal Myopathy.—MM. Babonneix and Lance showed a boy, aged 15 years, who, after an attack of measles at the age of five, developed slowly progressive myopathy. The unusual features in the case were the absence of any familial character, the existence of kypho-scoliosis (which was very rare in myopathy), the absence of characteristic attitudes and the presence of reaction of degeneration.

Prolonged Rheumatic Mitral Endocarditis with Rare Complications.—MM. L. Babonneix and Peignaux showed a woman, aged 27 years, who had suffered from rheumatic mitral endocarditis since the age of 7. The remarkable feature of the case was as follows: (1) The endocarditis appeared to have preceded the appearance of the joint symptoms. Cases of this kind had been published, but were not common. (2) The endocarditis had never been complicated by definite loss of compensation owing to the absence of any pericardial symphysis, as shown by radioscopy. (3) The process was still active, and revealed its existence from time to time by the production of capillary emboli. (4) The persistence of the acute character of the endocarditis was apparently due to the patient continuing to suffer from rheumatism and not taking salicylate of soda regularly or in sufficient doses.

Acquired Cerebral Hemiplegia.—M. J. Renault and Mlle. G. Labeaume reported a case of right hemiplegia with aphasia and hemianopsia, which had developed without apparent cause in a previously healthy infant aged 2 years. Hæmorrhage of the middle meningeal artery was suspected, but an exploratory operation in the right temporal region revealed nothing. A year after the attack the child presented a spastic right hemiplegia with aphasia, exactly like hemiplegia in the adult due to cerebral hæmorrhage. The paralysis was still present in the face, and the hemiplegia was more marked in the upper limb than in the lower. The child could walk and run, but could not use his hand. The prognosis was grave. The speakers thought the hæmorrhage was probably situated in the region of the internal capsule.

In the subsequent discussion M. Comby stated that the condition was undoubtedly due to acute encephalitis.

Cerebral Hæmorrhage in a Girl.—M. Remilly.—The patient was a girl, aged 8½ years. The father was alcoholic and the mother very nervous. The patient herself was of excitable disposition, but was in good health when she was suddenly seized with general convulsions and loss of consciousness. The convulsions lasted with brief intermissions for three days and were succeeded by coma with occasional slight convulsive movements. Death took place eight days from the onset. The autopsy showed marked congestion of the meninges on the left side with a few hæmorrhagic suffusions. On section a hæmorrhagic focus was found in the left frontal lobe extending in an antero-posterior direction. There was no evidence of encephalitis on microscopical examination. The other organs were normal.

Abstracts from Current Literature.

Tuberculosis.

Contagion of tuberculosis in childhood (*'Progrès méd.,'* 1923, 3e *sér.*, xxxviii, *p.* 136).—**P. Lereboullet.**—The contagiousness of tuberculosis was known long before Villemin and Koch's discoveries. Morgagni refused to perform autopsies on the tubercular. Even exposure of an infant for a few hours may lead to a fatal result. It is the aged chronic bronchitic and asthmatic who is the infecting agent, and usually the mother, although examples are given of the brother, sister, and even the grandmother. Comby found tuberculosis in 36 per cent. of his autopsies. The older the child the more likely it is to show evidence of disease. Again, the larger the family the more numerous are the tubercular cases. Are human or bovine sources of infection the more deadly? This is difficult to answer, as the lesions do not develop immediately after infection, and the site of the lesions does not always give information as to the mode of penetration of the bacillus. The dried sputum is particularly dangerous, and by this means Chaussé infected 50 per cent. of rabbits exposed to the dust from a sputum-infected carpet. The infectivity of dried sputum is much diminished in 21 days, and absolutely innocuous by 4 weeks. The primary lesion is usually in the lower lobe of the lung. Infection by inhalation is a proved fact. Lereboullet quotes cases of intestinal tuberculosis in children infected either by nurses with lesions in the mouth or by tubercular milk from infected cows, which point to the fact that infection has occurred through the alimentary tract. But primary tuberculosis of the intestine is very rare, and enlargement of the tracheo-bronchial five times more common than that of the mediastinal glands. Tuberculous milk is not of much danger, as so few tubercle bacilli are found in milk. Of 1000 persons taking raw milk only 2 cases of tuberculosis acquired by ingestion were recorded. Cases of cutaneous inoculation are recorded. A phthisical father kissed his child and a tuberculous ulcer developed on the cheek. A consumptive jeweller infected a young girl's ear lobule which he had pierced for a ring. The chief source of infection is human saliva and sputum.

CHRISTOPHER ROLLESTON.

Types of organism found in a series of tuberculous children (*'Amer. Journ. Dis. Child.,'* 1923, xxv, *p.* 234).—**J. K. Gordon** and **E. W. Brown** state that Park and Krumweide found that the bovine type was the infecting organism in 11 per cent. of all cases, and that 90 per cent. of these occurred in children under 16 years of age. Mitchell, in Edinburgh, studied 72 cases of tuberculous adenitis in children, and found the bovine bacillus in 90 per cent. Fraser in 70 cases of bone and joint disease found the same organism in 60 per cent. of his cases. The material to be tested was ground up with 10 c.c. of sterile saline in a mortar. Rabbits and guinea-pigs were then inoculated with the supernatant fluid both subcutaneously and intraperitoneally. In guinea-pigs the human and bovine types cause much the same lesions, but a more generalised tuberculosis is produced by the bovine variety. In rabbits no gross lesions followed the injection of the human bacillus, but in the case of the bovine organism there was enlargement and caseation of the inguinal glands, the lungs and the spleen being riddled with

tubercles, while intra-peritoneal inoculation resulted in a large caseous area at the site of injection, a large omental mass and miliary tuberculosis in the peritoneum, lungs and spleen. Small pieces of disintegrated tissue were then rubbed thoroughly over the surface of 10 tubes of Dorset egg medium. The tissues were removed from the tubes directly after inoculation. The human type is characterised by (1) equally luxuriant growth on egg and glycerine and egg media; (2) macroscopic appearance of growth 16–21 days; (3) dry and "crumby" colonies. The bovine variety is recognised by (1) very scanty or complete absence of growth on glycerine egg media; (2) constant but less luxuriant growth on pure egg media; (3) growth never appears before 21 days; (4) moist and flat colonies. The organisms in 30 tuberculous children varying in age from 4 months to 16 years were then investigated. The bovine organism was found in 10, or $33\frac{1}{3}$ per cent. 23 of the 30 children were under 5, the human organism being found in 17. The remaining 7 cases showed the bovine variety in 4, or 52 per cent., and the human in 3. 22 ended fatally; of these only 4 were due to bovine organisms. The human type was the infecting agent in all cases which began in the respiratory tract, and the bovine in those which began in the alimentary tract. 7 cases gave a history of contact with tuberculous persons. In 6 of these the human organism was found, and the one exception was a patient who had been exposed to a younger brother who died of generalised tuberculosis.

CHRISTOPHER ROLLESTON.

Congenital tuberculosis (*'Amer. Journ. Dis. Child.,'* 1922, XXIII, *p.* 88). —**G. P. Pratt** reports the case of a woman, aged 24 years, who died of acute miliary tuberculosis in the fifth month of pregnancy, and the autopsy showed fœtal tuberculosis without gross or microscopical lesions, tubercle bacilli only being found in smears from the cut surface of the liver. (*status bacillaris* of J. Honl).

J. D. ROLLESTON.

A case of disseminated miliary tuberculosis in a stillborn fœtus (*'Arch. Int. Med.,'* 1922, XXIX, *p.* 261).—**R. C. Whitman** and **L. W. Greene** report a case of disseminated miliary tuberculosis in a stillborn fœtus in the ninth month of gestation, whose mother had an attack of dulness with *râles* at the right apex. No animal inoculation tests were done, but the diagnosis in the case of the fœtus was firmly established by the character of the histological changes and the presence of tubercle bacilli in the urine. The writers have collected 113 authentic and 519 more or less doubtful cases of prenatal tuberculosis as well as a few others not listed in the bibliographies of Warthin and Cowie, Sitzenfrey, Péhu and Chalier, Lanz, Chomé and Parkes Weber (*v.* BRITISH JOURNAL OF CHILDREN'S DISEASES, 1916, xiii, p. 321), so that prenatal tuberculosis has ceased to be a mere curiosity of the laboratory and has become a pressing problem for the sanitarian.

J. D. ROLLESTON.

Tubercular infection of mother and newly born infant (*'Rev. de la Tuberculose,'* 1923, 3e sér., III, *p.* 68).—**L. Ribadeau-Dumas, J. Meyer,** and **Demerliac**.—The child was born prematurely on July 6, and fed on the breast for 20 days. Progress was good up till August 4, and the Pirquet's reaction was negative up to August 8. Towards the end of August the child began to cough and to suffer from diarrhœa and vomiting. Tubercle bacilli were abundant in the stools. On September 8 consolidation was noted at the right base, and on September 22 at the age

of 7 weeks death occurred. At the autopsy there was a right basal broncho-pneumonia with an area of purulent softening. Numerous small tubercles were scattered throughout both lungs. The mother was aged 19 years. Her father, mother, brothers and sister all died of tuberculosis. At 2½ years of age she suffered from tubercular dactylitis. In the third month of her pregnancy she had hæmoptysis. Fifteen days after the confinement she was attacked with sudden pain in the side. Dulness and crepitations were detected at both apices, and subcrepitant *râles* all over. Tubercle bacilli were present in the sputum. She died on October 11. A tuberculous broncho-pneumonia was found at the autopsy with ulceration at both apices. The incubation period in the infant was only 14 days, as the mother's illness did not begin until July 21. CHRISTOPHER ROLLESTON.

Infantile and hereditary tuberculosis (*'Progrès Méd.,'* 1923, 3e sér., XXXVIII, *p.* 49).—**P. Lereboullet.**—There is no doubt about familial tubercle. 31 per cent. of children born in tuberculous homes are infected, as compared with only 8 per cent. in healthy families. Is this due to predisposition, intra-uterine infection, or familial contagion? Transplacental infection is undeniable but rare, only 20 undoubted cases being known to the writer. A mother with 4 months' history of tuberculosis died in 3 days after the confinement. The infant died 3 days after birth. Advanced lesions were found in his mesenteric glands, spleen, lung, liver and peritoneum. In some the infantile tuberculosis is only demonstrated by inoculation. A 3 months' fœtus of a tuberculous mother had ascites. The ascitic fluid proved positive on injection into a guinea-pig. The result of tuberculin reactions and autopsies also demonstrates the extreme rarity of congenital tuberculosis. One per cent. of infants under 3 months old are tuberculous, 10 per cent. under a year, 24 per cent. under 2, and 40 per cent. from 2-4 years. The evidences for hereditary dystrophy are that the numbers of abortions in advanced cases of maternal tuberculosis are high. Generally, however, full-time children of tuberculous parents are of about normal weight and nutrition. A certain number of cases of para-tuberculous hereditary dystrophy exist, and are characterised by mitral stenosis, pulmonary stenosis, chlorosis, and flattening of the thorax, but such cases are found in children born to mothers suffering from influenza. The offspring of the tuberculous make a poor fight against tuberculosis, while others present torpid lesions, but generally speaking a hereditary predisposition cannot be proved, as infants separated from their tuberculous relatives or friends do not develop the disease. Heredity does not count in tuberculosis, but environment is of the greatest importance. 67 per cent. of children born to parents suffering from open tuberculosis are tuberculous from an early age, as contrasted with 2·5 per cent. among non-infected families. The only successful method of combating tuberculosis is to remove young children from their homes. CHRISTOPHER ROLLESTON.

Tuberculous bacillæmia in early infancy (*'Presse Méd.,'* 1923, XXX, *p.* 245).—**H. Lemaire** and **R. Turquéty.**—According to some there are two types—a primary bacillæmia preceding any local lesion, and a secondary. The tubercle bacillus in the first-named variety is engulfed by polymorphonuclear leucocytes, and is finally brought to rest in an organ where giant-cells appear. Clinically it is revealed by gastro-intestinal disturbances, anæmia, and progressive loss of weight. The secondary variety occurs in cases of adenitis, hilar glands, and splenomegaly. Tubercular

bacillæmia is rare in cases of chronic pulmonary tuberculosis, but André Jossuet obtained positive results in 11 out of 35 cases. These results have been disputed and attributed to cutaneous contamination, as inoculation experiments are almost constantly negative. Nobécourt and Dane examined the blood of 40 children, in whom 21 were acute cases, and only found the bacillus four times. Rist and others only found bacilli in 2 out of 50 cases. Baron concludes from his researches that bacillæmia is the rule in miliary tuberculosis and in tuberculosis of the cardio-vascular apparatus, but several examinations must be made. In all other forms of tuberculosis bacillæmia is very rare. There is no clinical indication of this condition. The writers found a bacillæmia in infants just before death, only discoverable by blood cultures and not accompanied by any physical sign or symptom. Inoculation into the peritoneal cavity or into the subcutaneous tissue of the flanks or backs of guinea-pigs were the methods employed. 10–15 c.c. of blood taken from the infant's longitudinal sinus were injected in fractional doses. Three positive results were obtained from 10 infants affected with acute miliary tuberculosis. Two of these were suffering from meningitis, and the third from hilar glands, papular necrotic tuberculides and enlarged glands in the thigh. Although numerous guinea-pigs were used to each case, only one for each of the three became tubercular. The disappearance of von Pirquet's reaction does not indicate the onset of bacillæmia, which is, if anything, rarer in the infant than in the adult.

CHRISTOPHER ROLLESTON.

Pulmonary tuberculosis in an infant (*'Brit. Med. Journ.,'* 1921, II, *p.* 738).—**A. G. Shurlock** describes a case in which an infant born to a mother who died of tuberculosis 2 months later developed signs of pulmonary tuberculosis at the age of 8 weeks. Wasting was marked, and the stools were loose and offensive. In the left lung there was a small area of impaired resonance below the inferior angle of the left scapula. The breath-sounds were higher pitched over this area but there were no adventitious sounds. There was gradual loss of weight the temperature; varied between 97° and 99°, only reaching 101° on two occasions. The number of respirations varied between 40 and 50 per second, and the pulse-rate between 110 and 140. Death occurred at the age of 3 months from diarrhœa and vomiting. Nothing was found of note in the brain or in the right lung, but in the left lung near the apex of the left lower lobe there was an area of tubercular consolidation about 1 c.c. square in extent. This area of consolidation extended into caseous glands in the left hilum. The infant had been removed from its mother and only allowed to see her for ten minutes a day, but Shurlock considers that the source of infection was the mother by inhalation through the respiratory track.

CHRISTOPHER ROLLESTON.

Two cases of rapidly fatal alveolitis in infants aged 3 to 5 months (*'Rev. de la Tuberculose,'* 1922, 3e *sér.*, III, *p.* 284).—**H. Barbier, L. Lebée** and **Covanet.**—The first case occurred in a male infant aged 3 months, who had been ailing for 8 days with a history of cough, urgent dyspnœa, and intestinal trouble. Death occurred in 24 hours. The pulmonary alveoli were found to be filled with an exudate formed by the remains of the alveolar lining. The alveolar walls were thickened and œdematous, without capillary congestion or leucocytic infiltration. Tubercle bacilli were present in enormous numbers and were located chiefly in the alveolar cavities, being most numerous where the catarrhal changes were most advanced. In

definitely caseous areas they were absent. The second case occurred in a girl, aged 5 months, exclusively fed on the breast. The illness began 2 weeks before admission to hospital with loss of appetite and weight and cough. On admission she was semi-stuporose and in a state of white cyanosis, with a frequent cough and rapid pulse. The pulmonary signs were those of congestion with patches of increased vocal resonance. No tubercle bacilli were found in the sputum. The weight remained stationary and the temperature oscillated round about 38° C. Death took place 4 days after admission. The lesions found were of the same nature but in a more advanced stage than in the first case. The mediastinal glands were about the size of peas and showed no trace of caseation. Neither of the mothers had active pulmonary tuberculosis, but the mother of the second case had had her leg amputated for tuberculosis of the knee-joint. Similar lesions are found in the lungs of guinea-pigs inoculated experimentally by the trachea. CHRISTOPHER ROLLESTON.

On the contagiousness of pulmonary tuberculosis during the first years of life (*'La Pediatria,'* 1921, XXIX, *p.* 633).—**O. Cozzolino** relates the case of an infant, aged 2½ years, in a healthy family, suffering from evident tuberculous broncho-adenopathy and pulmonary infiltration, in whom repeated examination of sputum taken from the larynx failed to reveal any tubercle bacilli. About two months later her sister, aged 8 years, was taken ill, and succumbed rapidly from acute miliary tuberculosis. A second case was that of an infant, 3 months old, with a healthy mother, who became ill with adenopathy and pulmonary tubercle. About 1½ months later a sister, aged 6 years, died of typical tuberculous meningitis. The author is of opinion that every case of glandular pulmonary tuberculosis in infants and young children, even though the surroundings are healthy, must be considered a bacillus carrier. VINCENT DICKINSON.

The frequency of tuberculosis in childhood (*'Amer. Journ. Dis. Child.,'* 1922, XXIII, *p.* 481).—**F. Hamburger** maintains that the only suitable method of applying the tuberculin test is subcutaneous injection (from 1 to 10 mgrm.) after a preceding cutaneous or percutaneous application. The cutaneous or percutaneous method alone should not be used. Too low a percentage is found by the cuti-reaction only. Thus Pirquet found in Viennese children from 11 to 14 years of age a tuberculosis of only 56 per cent., whereas Hamburger found an incidence of 95 per cent. among these children. J. D. ROLLESTON.

The initial and acute forms of tuberculosis in children (*'Revue de la Tuberculose,'* 1922, 3e *sér.* III, *p.* 387).—**H. Barbier.**—The initial lesion of tuberculosis usually occurs in the lungs in the form of a caseous or fibro-caseous or pure fibroid area associated with bronchial dilatation. These lesions are usually accompanied by an enlargement of the bronchial glands, quite out of proportion to that of the initial lesion, and frequently by mediastinitis. Anæmia and gastro-intestinal troubles are present as a rule. Under the influence of whooping-cough, influenza, etc., the tubercular trouble extends in the lung and metastases occur in the liver and meninges. In some cases the primary infection is followed almost at once by generalisation of the tubercles and death by meningitis. In such cases a small initial lesion which has already ulcerated is found in the lung and the usual tubercles in the brain, but the bronchial glands are scarcely at all involved.

In other cases the lesions in the liver appear to be of old standing and not contemporaneous with those in the lung and brain. They are perhaps derived from the placenta. Fever is inconstant. Loss of weight does not always occur. CHRISTOPHER ROLLESTON.

Pneumothorax in a boy, aged 7 years (*'Brit. Med. Journ.,'* 1922, I, *p.* 472).—**W. B. Martin** and **R. Knox** describe a case in a boy, aged 7 years, who, except for occasional attacks of abdominal pain, distension, diarrhœa, and a dry cough, was in good health. There were three small glands in the anterior triangles of the neck, and the tonsils were enlarged. Paravertebral areas of dulness were elicited in both interscapular regions, especially on the right. In these areas the breath-sounds were harsh. The only adventitious sounds were rhonchi at the left base, clearing up on coughing. A positive Pirquet reaction was obtained with a 50 per cent. solution of old tuberculin. Five weeks later he suddenly became dyspnœic, complained of abdominal pain and vomited. On examination the left side of the chest was tympanitic, there was no heart-dulness, and the cardiac apex-beat was located in the right mid-axillary line. Amphoric breathing and the coin phenomenon were present over the areas of abdominal resonance. Dyspnœa became less in a few weeks, but the physical signs persisted unchanged for three months. By the end of six months amphoric breathing had disappeared, but the "bruit d'airain" was still present. Nine months after the onset the heart was still in the right half of the chest and the left lung completely collapsed. Six weeks later the left lung began to expand, diminished breath-sounds of a normal type replacing the amphoric variety. Twelve months after the onset the position of the heart was normal, and four months later the breath-sounds on the left were normal. It is considered that the pneumothorax may have been due to the rupture of a small inactive cavity, or to the caseation of a gland in close connection with pulmonary tissue. The pneumothorax was of the valvular variety, the flap eventually becoming closed. On X-ray examination there was evidence of increased density of the roots of the lungs, particularly of the right, where the glands were enlarged. CHRISTOPHER ROLLESTON.

On a curable form of hilar pulmonary tuberculosis of the infant (*'Rev. de la Tuberculose,'* 1923, 3e sér., III, *p.* 13).—**L. Ribadeau-Dumas.** —Mortality lessens as age advances—from over 86 per cent. in the first year to 2·7 per cent. in the third year of life. A positive cutaneous reaction within the first weeks of life is of grave prognosis. In the majority of cases hilar pulmonary tuberculosis is the primary lesion. Secondary lesions in the skin, joints and glands may follow, or the disease may make rapid progress in the lungs. Within 6 weeks a case with hepatisation of the lungs may pass into the stage of ulceration and advanced cavitation. Some of these cases of tuberculosis resembling pneumonia in their activity recover. An infant of 12 months was infected by his nurse. The child's right lung was dull throughout its whole extent, with complete suppression of the breath-sounds. The temperature was 104°F. There was marked loss of weight, diarrhœa and anæmia. There was a very brisk and extensive cuti-reaction. The temperature fell in two months to 100·4°F. The dulness also decreased, and when seen six years later he was in sound health and presented no pulmonary abnormality. The first skiagram showed a diffuse opacity throughout the right lung, slightly attentuated in intensity at the apex, in the lower part of the axilla, at the level of the costo-diaphragmatic angle.

No hilar shadows could be distinguished. The left lung was clear. In the second skiagram the dense opacity had entirely disappeared two calcified areas were seen, one only a point and the other the size of a hemp-seed. Another case occurred in a child of 7 months, infected by her father, who had pronounced pulmonary tuberculosis. This case presented a triangular hilar shadow, and at the base of the right lung another triangular shadow with the base towards the thoracic wall and its apex towards the hilum. Eight years later the child was in perfect health, with no abnormal shadows in the skiagram. In infants these appearances may be explained by a double infection with the tubercle bacillus and the pneumococcus. In other cases there is a white pneumonia characterised by an epithelial alveolitis. The writer concludes that there is at first a small tubercle followed by an intense congestive reaction in the surrounding tissues. The latter results in pneumonia, which clears up, leaving the tuberculous nodule to persist.

CHRISTOPHER ROLLESTON.

Pulmonary tuberculosis of the adult type in a child (*'Arch. Lat. Amer. de Ped.,'* 1922, XVI, *p.* 116).—**V. Zerbino** records a case in a girl, aged 10 years, with pulmonary tuberculosis of the adult type, the lesions being confined to a cavity in the right apex associated with a good general condition and normal temperature. Tubercle bacilli were found in the sputum. The only complication was hæmoptysis. The issue of the case is not recorded.

J. D. ROLLESTON.

Tracheo-bronchial adenopathy simulating laryngeal diphtheria (*'Il. Policlinico, Sez. Prat.,'* 1922, XXIX, *p.* 80).—**G. Tron** describes a special form of tracheo-bronchial adenopathy, of which he records three examples in children, aged 4, 5 and 6 years. After an insidious onset symptoms of very severe respiratory stenosis suddenly develop closely resembling diphtheritic croup. Tron points out that movement of the larynx on inspiration, laryngeal stridor, aphonia and backward movement of the head are probable signs of laryngeal stenosis, whereas a fixed larynx, stertorous breathing, a falsetto voice and forward inclination of the head rather indicate tracheal stenosis. The possibility of tracheo-bronchial adenopathy should always be considered if there are no signs of disease in other organs in the neck or mediastinum, especially when there is a history of tuberculosis and other signs of this disease in the patient. The diagnosis is important, as the outlook is absolutely unfavourable and little is to be hoped from treatment.

J. D. ROLLESTON.

Tuberculous abscess of the myocardium (*'Lyon méd.,'* 1922, CXXXI, *p.* 540).—**E. Weill** and **A. Dufourt** record a case of tuberculous abscess of the myocardium in a female infant, aged 2 years, who died of non-tuberculous broncho-pneumonia. Inoculation of a guinea-pig proved the tuberculous nature of the pus. Different forms of tuberculosis of the heart may be met with, the gummatous being the commonest. The gummata, as in the general cases, are usually situated in the wall of the ventricle, especially the right. It is very exceptional for the gummata to break down, as in the present case. Usually tuberculosis of the heart is secondary to tuberculosis elsewhere, but in the present case the primary focus could not be discovered and the cuti-reaction was negative.

J. D. ROLLESTON.

The tetanic form of tuberculous meningitis (*'Arch. Lat.-Amer. de Ped.,'* 1922, XVI, *p.* 161).—**M. Acuña** and **F. Bazan** record a case of

the tetanic form of tuberculous meningitis in a girl, aged 10 years. This is the first example of the kind that has been described in a child. It exactly resembled the cases described by Boix and Thiroloix in alcoholic adults, which were characterised by convulsions, or generalised and permanent contracture of early onset, with paroxysmal exacerbations and loss of consciousness. The autopsy showed an absence of meningitis at the base and a predominance of the tuberculous lesions in the motor zone of the cerebral cortex. In the present case it is unknown whether there was a previous intoxication or neuropathic taint, but in view of the child's age it is more logical to suppose that there was a latent predisposition like spasmophilia, which was roused into activity by the tuberculous toxins or by direct action of the patches of meningitis on the psycho-motor centres.

J. D. Rolleston.

Tuberculous cervical adenitis in children (*'Boston Med. and Surg. Journ.,'* 1923, clxxxviii, *p.* 272).—**J. S. Stone** quotes examples of cows with tubercular udders or other lesions setting up cases of strumous glands in children. In these cases the tonsils and adenoids are first infected, the former causing enlargements of the glands in front of the sternomastoid, the latter those behind the same muscle. Carious teeth offer a nidus in which tubercle bacilli may develop and later cause tonsillar infection. Excision is indicated in the case of discrete tuberculous adenitis, and also when caseous glands are definitely encapsulated. Six hundred and two cases were treated, with 8 deaths—a mortality rate of 1·3 per cent. Some of these deaths were due to meningitis, both before and after operation or after exposure to X rays, others to systemic involvement. Tuberculin was but little used. X rays were very useful for the treatment of chronic ulcers and sinuses. The spinal accessory nerve was only injured in one case. The internal and anterior jugular veins were never damaged. A warning is given against "bloc" dissection, *i.e.* the removal of all the lymphatic channels as is practised in malignancy. Disregard of this may lead to injury of the spinal accessory, as this lies between the superficial and deep glands. The lower fibres of the facial nerve are very often injured. Christopher Rolleston.

Extra-pulmonary localisation of tuberculosis (*'Rev. de la Tuberculose,'* 1922, 3e *sér.*, iii, p. 223).—**E. Rist** describes interesting cases of tuberculosis following circumcision. The penes of two infants were sucked by a phthisical rabbi who died 2 months after the operation; one of the children recovered; the other died. In 10 cases observed by Lehmann preputial ulceration occurred in 10 days, and the adenopathy at the end of 3 weeks. Kolzow described 7 cases; 2 were fatal, 2 recovered incompletely, 2 were lost sight of, and only one recovered perfectly. Arluck and Winocouroff report a case of ritual circumcision in an 8 days old infant. The penis was sucked by a guest and in 15 days was swollen. At the age of 5 months the child was cachectic, and the sheath of the penis was transformed into a large ulcer extending on to the scrotum. There were large inguinal glands. On autopsy there were 7 tuberculous ulcers in the intestine, caseous degeneration of the pelvic, mesenteric and inguinal glands, a miliary tuberculosis of the lungs, spleen, and tracheo-bronchial and cervical glands. Rist quotes L. Bernard and Masselot, who found that of 1046 adult cases of pulmonary tuberculosis only 2·2 per cent. had suffered previously from ulcerating glands, and 8·1 per cent. had suffered from enlarged but not suppurating glands; 2·5 per cent. had other forms of

extra-pulmonary tuberculosis; 908, or 90·6 per cent., gave no history and presented no sign of extra-pulmonary tuberculosis. Grouven in 762 cases of lupus found 139, or 18·2 per cent., affected with pulmonary tuberculosis. On the other hand the inveterate cases of lupus nearly always present signs of disease in the lungs on autopsy, but always of a torpid nature. In 1897 Kuss demonstrated initial lesions in the lungs in all his cases of children dying from tuberculous meningitis, and in 1900 Naegeli of Zurich stated that these initial lesions persist throughout life in 97 per cent. of all cases in cicatricial condition, but in all these scars the bacilli can be found. These scars become calcified and are usually situated at the base of a lobe, sometimes in the axilla close under the pleura. They are accompanied by enlarged hilar glands. They are always found in ocular tuberculosis. Rist discusses the value of tuberculin in diagnosis, and states that a negative skin reaction in cases of hip disease may be of value in differentiating cases of simple contusion from tuberculous arthritis. The failure of tuberculin therapy is explained by the fact that patients become tolerant to enormous doses of tuberculin. A girl, aged 14 years, with a lupus of the cheek is stated to have received as much as $3\frac{1}{2}$ c.c. of pure tuberculin without any appreciable focal or general reaction, but with an intense reaction at the point of injection. CHRISTOPHER ROLLESTON.

Tuberculosis of the testicle in a child (*'Journ. Amer. Med. Assoc.,'* 1922, LXXIX, *p.* 2076).—**T. S. Eisenstaedt** describes a swelling of the left testicle to three times its normal size in a child of 3. It was tender on pressure and the epididymis was also enlarged. No radiological evidence of pulmonary or hilar tuberculosis was forthcoming. There was a leucocytosis of 13,750. A high castration was performed. In sections the tubules of the testis were entirely replaced by avascular cellular inflammatory tissue composed of fibroblasts and lymphocytes, and among these endothelial tubercles with giant-cells. The cord and epididymis were normal. In children the disease begins primarily in the testis, but in adults in the epididymis. The tubercles are usually in the interstitial tissues and about a blood-vessel. The infection takes place by the blood-stream. The testis and the epididymis are more commonly the sites of the primary foci than the seminal vesicles. CHRISTOPHER ROLLESTON.

Surgical tuberculosis in children (*'Journ. State Med.,'* 1922, XXX, *p.* 192).—**C. E. M. Jones** gives a description of the methods of treatment carried out at the Lord Mayor Treloar Cripples' Hospital, Alton. The most common variety of surgical tuberculosis is tuberculous disease of the bones and joints. It is of fundamental importance to realise that this condition is a local manifestation of a general disease, and that consequently every effort must be made towards the healing of the general disease as well as of the local lesions. Conservative treatment is carried out at Alton, by which is meant treatment which aims at the improvement of the general health of the patient and thus increasing his power of resistance to the disease, and which has for its object the preservation and restoration of the parts affected, as opposed to radical treatment, which endeavours to cure the disease by removing the local lesion. This method of treatment may therefore be said to consist of—(1) general treatment, the object of which is to improve the patient's health; and (2) local treatment, which deals with the local lesion. Under the heading of general treatment is included life in the open air, suitable climatic conditions, a generous diet of plain nourishing food, and,

more especially in the case of patients who require to be kept recumbent for long periods, mental recreation, such as is provided by suitable school work and training in light handicrafts, such as cane and basket work, needlework, leather work, etc., and by music and singing. Under the heading of local treatment would be included all means employed for the prevention of deformity and for the preservation and restoration of the part affected. Certain adjuvant methods of treatment, such as heliotherapy, vaccine therapy, balneotherapy, chemotherapy and the use of X rays are of the greatest value if used in combination with general and local treatment. The methods of treatment in tuberculous spinal disease, hip disease and disease of the knee are discussed in greater detail. J. Allan.

Diagnosis of tuberculosis in infancy ('*Paris méd.*,' 1923, I, *p.* 18).—**P. Nobécourt** and **J. Paraf**, in the course of two years, have observed 60 cases of tuberculosis among infants, aged from 1 to 17 months, admitted to the Crêche at the Hôpital des Enfants Malades, Paris. In most of the cases the clinical diagnosis of tuberculosis was impossible, the infants having been admitted for a gastro-intestinal affection or marasmus. Of the 60 cases 33 did not have any respiratory symptoms, and of the 27 others only 9 presented the clinical appearances of tuberculosis. The cuti-reaction was the only means of establishing a rapid and certain diagnosis. In many instances the rapid course enabled a correct diagnosis to be made, since 21 patients died of meningitis less than a fortnight after admission, and 5 of broncho-pneumonia or rapidly fatal miliary tuberculosis.

J. D. Rolleston.

Data in 3742 Pirquet tests ('*Amer. Journ. Dis. Child.*,' 1922, XXIV, *p.* 73).—**S. McLean** and **H. Jeidell** state that from August, 1913, to January, 1919, the Pirquet test was applied at the Babies' Hospital, New York, in 3742 cases, of which 573, or 15·3 per cent., were positive, with approximately the same proportion of positive tests for each sex, males having 15·42 per cent. positive, and females 15·14 per cent. positive. The percentage of positive reactions in the first three months of life was 1·80, between three and six months 7·89, between six and nine months 10·15, between nine and twelve months 13·70, between twelve and eighteen months 17·04, between eighteen and twenty-four months 18·73, between two and three years 28·84, and at three years and over 32·24. Of the 147 children under one year of age who gave a positive reaction 75 died in hospital, and 17 others were removed, of whom 7 had tuberculous meningitis, making a total of 54·6 per cent. of proven cases of tuberculosis, while 10 had clinical evidence of tuberculosis in some other form on discharge.

J. D. Rolleston.

The present state of the tuberculin reaction in childhood ('*Arch. de Méd. des Enf.*,' 1923, XXVI, *p.* 68).—**E. Mensi** bases his work on 3000 tuberculin reactions. 26·39 per cent. of cutaneous tests were positive as compared with 34 per cent. of intradermal tests. Among the 629 cutaneous tests to both human and bovine tuberculin, 27 reacted differently to the two tuberculins; 11 of these were cases of osseous or glandular tuberculosis which reacted more briskly to the bovine variety. The incubation period between exposure and the appearance of the reaction may be as short as two months or as much as four, and may depend upon the quality of the tuberculin. A positive reaction in infants under 1 year is usually regarded as

indicating active tuberculosis, but the writer regards the dictum that after 1 year the reaction is valueless is not proven, and quotes 4 cases where a positive Mantoux reaction was associated with intestinal tuberculosis, and another in which a positive reaction was followed by tuberculous meningitis in a girl aged 12 years. The Wildbolz reaction in 115 infants was negative in 114 instances with healthy urine, positive in 52 to tuberculin, and positive to tuberculous urine in 35. In 40 children reacting positively to the Mantoux test the auto-urine reaction was positive in 20. In another series of 25 children undoubtedly affected with active tuberculosis the auto-urine reaction was positive in 13 in; 15 clinically non-tuberculous but with a positive Mantoux reaction there were 7 positive auto-urine reactions. The auto-urine reaction, therefore, is not a reliable test of activity. The reaction varies directly as the state of nutrition, the worse the latter the less intense the reaction. Of 81 consecutive reactions on 33 children, 2 were equal to the first reaction, 30 were stronger, and 49 were less. The appearance of the areola varied from 4 to 7 hours after operation. A larger number of positive reactions was obtained in winter than in summer.

CHRISTOPHER ROLLESTON.

Methods for demonstrating the genesis of pulmonary tuberculosis in childhood (*'Tubercle,'* 1922, IV, *p.* 63).—**R. Brinchmann.**—The number of infected children even in the first year of life is great, and the differences in the findings of various investigators are so marked that doubts arise as to the reliability of the methods employed. Pirquet's method is unsatisfactory, for Moro tested 10 tuberculin-positive children with 5 different brands of old tuberculin and obtained a varying number of positives with each sample of Koch's preparation. Again, Klercker found 20 per cent. positive to Pirquet's test, but 55 per cent. of the same children reacted positively to Mantoux's intracutaneous test. It is important, therefore, to elucidate the nature of the difference between these two tests.

CHRISTOPHER ROLLESTON.

The Wildbolz reaction in pædiatric practice (*'Nederl. Tijdschr. v. Geneesk.,'* 1922, I, *p.* 1868).—**J. C. Schiffers** and **S. B. de Vries Robles** state that in 1919 the Berne surgeon, H. Wildbolz, introduced the following method to show whether a tuberculous focus was active or not. 150 c.c. of the patient's urine is evaporated to one-tenth of its value *in vacuo*, and 0·1 c.c. is injected intracutaneously. Wildbolz's reaction is thus Mantoux's reaction with the patient's own urine. As the result of observations at the Emma Children's Hospital at Amsterdam on 49 children, in 20 of whom the reaction was repeated, the writers concluded that as a general rule there was a parallelism between Mantoux's and Wildbolz's reactions, and that therefore Wildbolz's reaction was specific of tuberculosis, but their experience did not support the view that the test indicated the activity or otherwise of a tuberculous focus. **W. F. Enklaar** (*ibid.*, p. 1876), on the other hand, from his experience of the reaction came to the following conclusions: (1) A strongly positive reaction is undoubtedly a sign of an active tuberculous process; (2) a negative Wildbolz reaction is against active tuberculosis; (3) a weakly positive Wildbolz reaction is of no diagnostic value.

J. D. ROLLESTON.

Tuberculous antigens in infantile tuberculosis (*'La Pediatria,'* 1922, XXX, *p.* 793).—**A. de Capite** has made some observations regarding Wildbolz's auto-urine reaction in tuberculous infants, using an intradermo-

reaction with urine concentrated to one-tenth. This test is based on the allergic reaction of the skin in the presence of tuberculous toxins continually eliminated by the urine from an active focus existing in an organism affected by tuberculosis. The observations were made on twelve newborn, forty infants and thirteen older children. The author adopted Nasso's modification of the test: 50–100 grm. of urine collected under sterilised conditions were allowed to remain in an incubator at 60–65° C. for about three to four hours, so that a concentration of a tenth was obtained and most of the salts remained at the bottom of the receptacle; thence it was repeatedly passed through a filter soaked in a 2 per cent. phenol solution and two to three drops of the filtrate injected under the skin—the urine similarly prepared from a healthy subject being used as a control (normo-uro-reaction). The test was always positive in infants with active tuberculous foci, while in those suffering from other diseases it was constantly negative. Only in newborn infants with marked sensitiveness of the skin was the test devoid of any useful application. The results obtained in older children were the same as those with other tuberculin tests, but Wildbolz's reaction was of greater utility, as it could in negative cases be used on allergic individuals, in whom it afforded a more certain control of the nature and of the more or less activity of the tuberculous process. The advantages of this test are manifest not only for diagnosis but for the prognosis of an active tuberculous lesion, since the more intense reactions caused by the large amount of antigens eliminated by the urine correspond exactly to the greater intensity of the morbid process.

VINCENT DICKINSON.

Tuberculous antigens in the cerebro-spinal fluid (*'La Pediatria,'* 1922, xxx, *p.* 193).—**I. Nasso** investigated this question in nine cases, and found that an intense intra dermo-reaction produced by cerebro-spinal fluid concentrated to one-tenth is pathognomonic for tuberculous meningitis and miliary tubercle. Tubercular antigens must therefore be present in large quantity in the cerebro-spinal fluid of individuals affected with these diseases. The reaction has not only a scientific but also a practical value. In other forms of tuberculosis, even if active, probably owing to the small quantity of antigen in the fluid, the intra-dermo reaction is negative.

VINCENT DICKINSON.

Deviation of the complement in infantile tuberculosis (*'La Pediatria,'* 1921, xxix, *p.* 500).—**R. Kharina-Marinucci,** after a number of experiments, finds that the behaviour of deviation of the complement in infantile tuberculosis varies markedly in relation to the antigens used. Among these the most sensitive is hydro-ether-alcohol extract of tubercle bacilli. As is the case with syphilis, the reaction has a diagnostic value only when positive whatever antigen be used. From a practical point of view it is of scanty value in comparison with other methods, such as the cuti-reaction and intra-dermo reaction. The reaction is of no value in prognosis in infantile tuberculosis.

VINCENT DICKINSON.

Immediate causes and prognosis of tuberculosis of the newborn (*'Journ. de Med. et de Chir. prat.,'* 1922, xciii, *p.* 885).—**L. Ribadeau-Dumas** states that the mortality rate for infants born to tuberculous mothers is 33·5 per cent.; if the fathers are infected it is only 14 per cent. In 175 families the tuberculosis morbidity among the children reached the high figure of 60 per cent., and their mortality 40 per cent. Among 2200

removed from the infected homes under the Grancher scheme only 7 cases of tuberculosis were discovered; of these 5 were cured, and 2 succumbed to meningitis. The infecting agent was investigated in 100 cases attending the Trousseau Hospital. In 28 no opinion could be formed owing to insufficient information. In 29 cases there was maternal infection, in 20 cases paternal tuberculosis, and in 5 these diseases existed among near relatives. No source of infection was discovered in 3. R. Oswald Leipzig investigated 113 cases, and established the origin of the disease in 59. In 27 maternal infection was established, in 21 paternal infection, and in 11 the source was traced to tuberculous relatives or strangers. Lampson says that 67 per cent. of infants born to parents suffering from open tuberculosis become tuberculous, and 22 per cent. of those born to parents affected with latent forms of the disease. The incubation period is estimated as 30 days by Hamburger but varies from 8 days to 2 or 3 months. A case is quoted of a child of 12 years who entered the hospital in March with a negative Pirquet reaction which persisted as negative until July. Between July 14 and 16 the reaction became positive. On investigation this child had played at drafts with a phthisical patient between June 24 and June 28, who did not occupy the same ward. The incubation period was 18 days. The period of contact need not be long. Periods as short as 10, 17 and 20 days have been found sufficient. Intimate contact is necessary. An instance is quoted of two children of the same family coming in contact with a phthisical girl; one of them kept away from her as much as possible and was not infected. The mortality of infants is less than was formerly thought, being 86 per cent. of those infected in the first year, 11 per cent. of those in the second year, and only 3 per cent. of those between 2 and 3 years old. The glandular pulmonary type may be inactive or may be highly dangerous, and this may be due to defective resisting powers or by some too long continued doses.

CHRISTOPHER ROLLESTON.

The prognosis of tuberculosis in infants (*'Münch. med. Woch.,'* 1923, LXX, *p.* 76).—**H. Langer** states that up till recently tuberculosis in infancy was regarded as having an absolutely unfavourable prognosis, although a few writers have for long disputed the correctness of this view. Thus Harms estimates the mortality from tuberculosis among infants in Mannheim at 11 per cent. Bräuning has also protested against the unfavourable prognosis of infantile tuberculosis. The explanation for this difference of opinion is doubtless due to the diagnosis of tuberculosis in infants having formerly been based principally on clinical evidence, whereas to-day more extensive use is made of biological tests. Langer's experience is based on the study of 140 tuberculous infants up to the age of 18 months, amongst whom the mortality was 60 per cent. If only the cases up to the end of the first year be included, the mortality rises to 66 per cent.—in other words, a third or more of the children have survived tuberculous infection in infancy. Of the 56 surviving children 50 had reached the latent stage, so that the primary infection may be regarded as overcome. Half these cases had been under observation for more than four years, and some had been followed up for ten years.

J. D. ROLLESTON.

Nutritional treatment of tuberculosis (*'New York Med. Journ.,'* 1922, CXV, *p.* 121).—**C. Pirquet** mentions that tuberculosis is a nutritional disease in the sense that tubercle bacilli, which are present in the body of practically

every adult inhabitant of a city, are not allowed to spread and overwhelm the organism as long as this is in a good state of nutrition. Pirquet has now abandoned all methods but feeding in the treatment of tuberculosis and does not use tuberculin or any other form of medical treatment.

J. D. Rolleston.

Artificial pneumothorax in children (*'Lyon méd.,'* 1922, cxxxi, *p.* 1024). —**Péhu, Cordier** and **Bonafé** state that artificial pneumothorax is much less frequently indicated in the child than in the adult for the following reasons: (1) Unilateral pulmonary disease is infrequent in children under 10, and even above that age the cases are more frequently bilateral than in the adult. It is not until the age of 15 that the anatomical type resembles that of the apical form in the adult. (2) Pleural symphysis and adhesions are more frequent in children. (3) Compression of the lung is difficult to effect owing to the rapid pushing back of the mediastinum, which gives rise to dyspnœa and cyanosis. Out of a series of 250 tuberculous children under the writers' observation, the operation was undertaken in only 8 cases, in 4 of which it had to be rapidly given up, 3 developed signs on the opposite side, and only 1 had shown a satisfactory result for more than four months.

J. D. Rolleston.

Artificial pneumothorax in the child (*'Arch. de méd. des enf.,'* 1922, xxv, *p.* 599).—**L. Babonneix** and **J. Denozelle** remark that artificial pneumothorax is rarely indicated in children, since out of 280 cases of pulmonary tuberculosis in children, in only 12, or 4 per cent., was the disease strictly unilateral; 7 of the 12 were treated by artificial pneumothorax; in the other 5 the presence of pleural adhesions prevented separation of the pleura. The results were as follows: (1) In all the cases without exception the mediastinum underwent a rapid and considerable displacement, with considerable flattening of the corresponding half of the diaphragm. (2) Thoracic deformities occurred very early, consisting in retraction of the wall of the thorax on the pneumothorax side, and scoliosis, which subsequently became more pronounced. (3) Pneumothorax on the opposite side occurred in 3 cases during the first month and ended in resolution. To prevent such an occurrence the compression should always be slow and progressive, so as not to drive the contents of the cavity into the bronchi. In one case there was improvement of the general condition but persistence of tubercle bacilli in the sputum. In the other 3 cases the local and general results were excellent and seemed likely to be permanent.

J. D. Rolleston.

Artificial pneumothorax in tuberculous children (*'Bull. de l'Acad. de Méd.,'* 1923, 3e *sér.*, lxxxix, *p.* 346).—**Armand-Delille** relates his experience of 25 cases. The number of cases suitable he considers to be about 10 per cent. of those passing through his hands. In 5 no satisfactory pneumothorax could be induced. In children the hilar glands are always involved on both sides, but this is no contra-indication to operation. No chest deformity resulted, and the normal increase in growth and weight was noted in all except two. In certain cases the lung was allowed to expand after a compression of 14 or 15 months' duration. Christopher Rolleston.

Advantages and disadvantages of artificial pneumothorax in the treatment of pulmonary tuberculosis (*'Tubercle,'* 1923, iv, *p.* 297).—**G. E. Soltau** relates her experience of this form of treatment. In 20 cases

under 16 years of age, 13 were between the ages of 13 and 15, 1 was aged 5, and the ages of the others were between 9 and 11 years. Pleural adhesions prevented collapse in 2. Tubercle bacilli were present in 10. In 10 cases the results have been excellent, but in only 5 of these were tubercle bacilli found in the sputum. Where the latter are present in large numbers the prognosis is poor. The child aged 5 had a cavity in the upper lobe of the left lung with infiltration throughout. She did well for a year and then relapsed. To show the disappointing results in acute cases the author quotes her experience with a girl of 14 in whom cavitation appeared suddenly in the left lung. Improvement lasted for 3 months, but thereafter the temperature became swinging and death occurred 18 months after the onset. CHRISTOPHER ROLLESTON.

Tuberculous peritonitis treated by radium (*'Dublin Journ. Med. Sci.,'* 1922, *4th series, p.* 632).—**W. C. Stevenson** records two cases in children aged 12 and 17 years respectively. The first patient, a girl, on admission to hospital looked extremely ill—pulse 108, temperature 97° F.; abdomen swollen and tender, especially in the neighbourhood of McBurney's point. The abdomen felt doughy, and there were two flat firm plaques which could be felt deep to the abdominal muscles, one mostly above and to the right of the umbilicus, and the second below and to the left. A diagnosis of tuberculous peritonitis of the plastic variety without excessive fluid was made. The patient was treated in bed on general lines, cod-liver oil on lint being applied to the abdomen. Radium was applied to the abdomen, and a fortnight after the first treatment the abdomen felt less doughy; a fortnight later the plaques, which felt almost calcareous, were more distinctly defined, but covered a smaller area, as if the surrounding infiltration had been absorbed. When last seen there was still some thickening round the umbilicus, which was comparatively difficult to feel. The patient looked quite robust, had grown tremendously and become fat. Radium had been applied on four occasions. The second patient, a boy, was dealt with on similar lines, with good results. The radium treatment in these cases was administered by the surface application of emanation capillaries. Interesting data regarding technique of treatment, calculation of dose, etc., are given. J. ALLAN.

Reviews.

QUATRE LEÇONS SUR LE RACHITISME. By Prof. A. B. MARFAN. Paris: J. B. Baillière et Fils, 1923. Price 4 fr.

THERE is indeed a great pleasure in store for the clinician who turns from the surfeit of current literature on experimental rickets to Prof. Marfan's monograph. Therein the reader will find word-pictures of the disease as it occurs in the human subject penned by one of the master clinicians of our time, and word-pictures that will recall those of our old masters such as are to-day unfortunately too rare. For us there could be no greater praise than this.

The author has set out to present us with the fruits of his long and ripe experience, and has chosen—and we think wisely chosen—to refrain from the discussion of much of the modern theory. It has seldom been our lot to read such full and living descriptions of a disease, and with his views on the

histology and symptomatology all workers will agree. With his discussion of the ætiology, however, we do not find ourselves in such harmony. Like many writers of to-day he invokes the aid of many factors to explain its development, because all cases cannot be reconciled with one specific cause. As exciting or predisposing factors he cites defective hygiene, diet, gastro-intestinal disorders, heredity, tuberculosis and syphilis, and of all these he considers syphilis the most potent! He says, "There does not seem to me to be any doubt that syphilis is the most frequent cause of rickets, but—and this is the point on which I differ from Parrot—I do not consider it the only cause; rickets may attack infants free from syphilis." In a country like Britain, where syphilis, at least the congenital variety, is relatively so rare and rickets so rife, it is difficult to homologate such a statement, but we feel certain that Prof. Marfan would be the first to understand our scepticism. L. F.

Les Syndromes Endocriniens dans l'Enfance et la Jeunesse. By Dr. P. Nobécourt, Professor of Children's Diseases of the Paris Faculty of Medicine. Paris: Ernest Flammarion, 1923. Pp. 314; with 26 figures in the text. Price 10 fr. net.

This forms one of the volumes of the "Bibliothèque des Connaissances Médicales," published under the direction of Dr. Apert. It is a handbook on the endocrine syndromes or symptom-complexes that occur in childhood and youth, and the little work should be found useful by many. Apparently no similar book has been published as yet in England. The style is clear, and care has been taken to explain the meaning and the etymology of the various terms used, notably those peculiar to the relatively modern doctrines of endocrinology. In the introductory portions careful data on normal growth and the onset of puberty are furnished for purposes of comparison with the abnormalities observed in endocrine syndromes. The author then deals in order with the syndromes of thyroid origin (myxœdema, cretinism, exophthalmic goitre, incomplete syndromes), of parathyroid origin, of pituitary origin, of pineal origin, of thymic origin, of suprarenal origin, of testicular and ovarian origin, and the syndromes of pluriglandular origin. The ætiological factors in the production of the various syndromes (heredity, tumours, syphilis, etc.) are of course discussed, and the methods of treatment (by opotherapy and otherwise) are considered. It is interesting to note that Hastings Gilford's "progeria" is given (page 237) as a hypotrophic suprarenal syndrome. The reviewer suspected that cases of progeria might have been described in France under the heading "gerodermia"—that is to say, a condition of skin in childhood resembling that of aged persons. Apparently that is actually the case, for the author states that cases of the rare hypotrophic suprarenal syndrome present the features described under the term "progeria" by Hastings Gilford ("Hastings and Gilford" is doubtless due to a slip of the pen), "nanisme à type sénile" (dwarfism of senile type) by Variot and Pironneau, and "gérodermie" by Apert. Precocious development of suprarenal origin, as described by Bulloch and Sequeira, Leonard Guthrie, etc., in their writings on the subject, appears to have been somewhat neglected. F. P. W.

Heliotherapy. By A. Rollier, M.D. London: Henry Frowde & Hodder & Stoughton, 1923. Pp. 288. Price 25*s*. net.

This volume is based upon a book entitled 'La Cure de Soleil,' brought out by Dr. Rollier before the war, but it contains a great deal of new

matter and has been thoroughly revised and partly re-written. Supplementary chapters are contributed by Drs. A. J. Rosselet, H. J. Schmid and E. Amstad on "The Scientific Basis of Heliotherapy," "The Radiological Diagnosis of Osteo-articular Tuberculosis and the Radiographic Control of the Clinical Results of Heliotherapy," "The Adjuvants of Heliotherapy," and "The Heliotherapy of Non-tuberculous Diseases."

After a short historical introduction Dr. Rollier discusses the therapeutic action of the sun-bath and the general technique of its administration, special emphasis being laid on the two points of strict individualisation of treatment and careful graduation of dosage. A point of practical importance in heliotherapy of high altitudes is that insolation should only be practised when the air is relatively cool, and Dr. Straube, who was under treatment for spinal caries, is quoted as saying: "With the thermometer at 8° C. [46·4° F.] in the shade and 50° C. [122° F.] in the sun, the sun-bath was a real pleasure to me; the fresh air has a stimulating action which modifies the burning sun. . . . With 23° C. [71·6° F.] in the shade and only 45° C. [113° F.] in the sun, the sun-bath was a hardship."

The longest section in the book is taken up with a discussion of regional heliotherapy in tuberculosis, a number of case-histories, many of them illustrated by skiagrams and photographs, being included. The photographs, even apart from the letterpress, are most impressive, and form an eloquent tribute to the value of the sun cure in various forms of surgical tuberculosis.

Two useful appendices give the contra-indications of heliotherapy and the indications for operative interference. The only absolute contra-indications appear to be in cases of severe or advanced disease of the circulatory system, high fever with toxæmia, and cases of renal disease of however mild a type, although in regard to this last point the writer admits that he may have been unduly cautious.

A chapter is devoted to occupational therapy, which Dr. Rollier looks upon as valuable both from a mental and a physical standpoint, though great care is necessary in its application, more especially in cases of pulmonary tuberculosis.

Dr. Rollier's book is of great interest, and is likely to be the standard work on heliotherapy for a long time to come. E. M.

La Pratique de L'Alimentation des Nourrissons. Par Dr. Georges Schreiber. Paris: Gaston Doin, 1923. Pp. 311. Price 12 fr.

In this small volume Dr. Schreiber has, at the request of his students, brought together the substance of his lectures on infant feeding delivered at the Institut de puériculture de la Maternité. The book opens, as all books on this subject should do, with the clear and uncompromising statement that there is no other milk whatever which has even approximately the same value for the infant as that of its mother, and that no other method of feeding is so simple or attended with so few disadvantages. The equally important statement is added that practically every mother is capable of nursing her baby—a statement with which the present reviewer is in cordial agreement, although it runs counter to the opinion widely held even to-day. The subject of breast-feeding is adequately discussed, and a chapter is added on methods of administering human milk other than by putting the baby to the breast, as indicated where there is malformation of the breast or nipple, or in severe cases of hare-lip in the infant, or in insufficiency of the

muscles used in suction such as is usually associated with severe congenital debility. Most of the remainder of the book is devoted to the question of artificial feeding, including the modification of cow's milk, sterilisation of milk by heat, homogeneised, concentrated and modified milks. In the final chapter Dr. Schreiber discusses various dietaries suitable for sick infants, with the indications for each, as well as foods suitable for use after the ninth month of life.

The book, which is furnished with a table of contents and a good index, should be found useful by mothers and nurses. E. M.

Nursery Guide for Mothers and Nurses. By Louis W. Sauer, M.D. London: Henry Kimpton, 1923. Pp. 188. Price 8*s.* 6*d.* net.

Dr. Sauer's book for mothers and nurses contains a great deal of good advice couched in simple and untechnical language. The book has seven chapters, in which are discussed the main points connected with the care of the nursing mother and of the newly born infant; breast-feeding; artificial feeding; the care of the premature infant; nutritional disturbances of the artificially fed infant; some common ailments; and care of the sick infant. These last two chapters are particularly full for a book of this size, and are eminently practical. The elaboration of such small points as the proper way to take a rectal temperature, directions for giving a hot pack, a tepid pack and a mustard pack (a useful form of treatment unfortunately little used in this country) make the volume particularly suitable for those mothers and nurses whose knowledge on the subject of infant care is almost *nil*. We are glad to see the emphasis laid by the author on the fact that teething is a normal process in the infant, and should cause no more trouble or pain than the growing of hair or nails. It is even now not uncommon to find a rash, otorrhœa or adenitis put down by the doctor as due to teething and therefore of negligible importance. The advice given throughout the book is up to date, and includes the use of toxin-antitoxin treatment for diphtheria when indicated by the Schick test, and the prophylaxis of measles by the injection of serum from a convalescent case.

The book is well printed on good paper, and contains a few excellent illustrations. E. M.

L'Année Thérapeutique. Par L. Cheinisse. Paris: Masson et Cie, 1923. Pp. 208. Price 7 fr. net.

For the third year in succession Dr. Cheinisse has issued his useful little *précis* of the therapeutic remedies and procedures which saw the light during 1922. The plan adopted in the volume is the same as in former years: under the alphabetical list of diseases are given details of the new treatment, usually with a reference to the publication in which it first appeared. Among the more noteworthy of the reports are the intravenous injection of the patient's own cerebro-spinal fluid in cases of post-encephalitic myoclonia (a remedy which was later unsuccessfully applied in Parkinson's disease); the acidification of the urine as a cure for nocturnal enuresis; sodium hyposulphite in recurrent herpes; potassium permanganate as a dressing for burns; lumbar puncture in asthma; intra-muscular injections of sulphur in chronic arthritis deformans; and auto-hæmatotherapy in furunculosis. A somewhat unaccountable omission is found in the absence of all reference to the epoch-making discovery of insulin in the early months of 1922. The only reference under the heading of diabetes is to the dietetic treatment of the disease.

The last portion of the book is devoted to a short description of the technique of various therapeutic procedures, including an excellent account of the phenomena of adsorption. Dr. Cheinisse's new volume is assured of a welcome as hearty as that accorded to its predecessors. E. M.

ASTHMA. By FRANK COKE, F.R.C.S. Bristol: John Wright & Sons. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1923. Pp. viii + 259. Price 15*s.* net.

IN this very readable book Mr. Coke has brought together the substance of most of the newest work on asthma—using the term in its broadest sense. In an introductory note he draws attention to the fact that much of this work, in its ætiological aspect at least, was preshadowed in 1868 by Hyde Salter, extracts from whose remarkable book are quoted at some length by Mr. Coke in support of this assertion. From the definition of asthma and a consideration of its anatomical and physiological aspects Mr. Coke passes on to the subject of sensitisation to foreign proteins, and it is probably here that the book will be found of the greatest interest and value. The relation between asthma and anaphylaxis is discussed, the author coining the word *adzyme* to denote the factor—which is evidently not a simple enzyme—by which sensitisation to a foreign protein takes place in an animal. He suggests that proteins entering the body in minute quantities are dealt with by the neutral adzymes of the body, *e.g.* in the proteolytic action of the liver and other cells, and that when larger quantities of the protein are introduced a specific adzyme is formed to deal with it. The specific adzyme acts upon or in some way unites with the particular protein, forming a poisonous combination causing anaphylaxis, the anaphylactic response to further doses of the protein taking the form of asthma or of urticaria resulting from a general sensitisation of all the cells of the body, including those of the skin.

Stress is laid on the importance of the dermal reaction, which is the key-note to all the newest diagnostic work on asthma, an excellent coloured plate showing clearly the types of dermal reaction that may be expected. In the author's series of 350 cases of asthma, 182, or 52 per cent., gave positive results—a proportion somewhat higher than that obtained by other workers in America and in this country, but which may possibly be accounted for by the fact that the author eschews group testing and confines himself to the tedious but undeniably more accurate single protein tests. The *rôle* of hereditary and other antecedent causes of asthma is discussed in an interesting chapter, but while the author admits that well-marked types of asthma may develop as a sequel to acute bronchitis or pneumonia, we hardly think that sufficient weight is given to the fact that asthma is often secondary to acute or chronic catarrhal infection of the upper respiratory tract, as was pointed out by Dr. E. P. Poulton in a recent paper in the *Lancet*. Mr. Coke believes that nasal symptoms in asthma are more likely to be part of the complaint than the cause of it.

The question of treatment occupies nearly one-third of the book, the treatment of an acute paroxysm, vaccine treatment and specific and non-specific protein therapy being discussed at some length. In a certain class of case Mr. Coke considers the method of Danysz to be of supreme importance, this mixed coliform vaccine, administered hypodermically or orally, having been successful in a large number of cases, including some associated with urticaria, eczema, pruritus and migraine.

Mr. Coke's book obviously contains the record of much careful observa-

tion and experiments, and will undoubtedly be read with great interest by the general medical practitioner. E. M.

HODGKIN'S DISEASE. By R. ALLAN BENNETT, M.D.Lond., M.R.C.P. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1923. Pp. 56. Price 2*s*. net.

THIS is an interesting and instructive monograph on an interesting and important disease, which makes the reader think more or less critically on what he is reading. The instructiveness is thereby increased, and it should be read with pleasure by practitioners and others. Dr. Bennett agrees with other writers that Hodgkin's disease (using the term in the limited sense of what is generally called "lymphogranulomatosis maligna" on the continent) is an infective granuloma of unknown causation, but he is inclined to think that the infective agent is in some way allied to the tubercle bacillus. The reviewer believes that there is no sufficient evidence available to show that there is any direct causative relationship with tuberculosis. That patients with Hodgkin's disease not very rarely likewise have glandular or pulmonary tuberculosis, and sometimes die with acute miliary disseminated tuberculosis, is universally admitted, but the frequency and the age-incidence of tuberculosis is probably sufficient to account for the association of the two diseases whenever it occurs. Latent tuberculosis of lymphatic glands is undoubtedly very common, and it is possible that Hodgkin's disease may sometimes arouse quiescent and latent glandular tuberculosis to fresh activity. The frequency of latent glandular tuberculosis may likewise account for the occasional positive results of guinea-pig inoculation from supposed pure cases of Hodgkin's disease. The reviewer regards lymphogranulomatosis maligna (Hodgkin's disease) as an infection of some kind of the lymphatic endothelial or endothelial-reticular tissue, commencing most frequently in the cervical or axillary glands. But as the disease progresses and the infective agent (whatever it may be) becomes more and more disseminated over the body, the whole lymphatic glandular system may become involved. In fact, since lymphatic radicles with their endothelial elements are present in almost all parts of the body, it is not surprising that typical lymphogranulomatous growth may occasionally be found in organs or parts of the body which are supposed normally to be destitute of lymphatic glandular (lymphadenoid) tissue. In advanced cases lymphogranulomatous nodules in the liver are quite common, and in rare cases the vertebral periosteum may be affected, and lymphogranulomatous growth may take place in the loose fatty and connective tissue in the vertebral canal outside the dura mater (*cf.* an article by F. Parkes Weber in the 'Quarterly Journal of Medicine,' October, 1923). As fibrosis and destruction of the affected lymphatic glands progress, the lymphocytes in the circulating blood tend to diminish in number. Sometimes the progressive glandular fibrosis seems to be accompanied by attempts at compensatory regenerative hyperplasia. As in most infective diseases, so also in Hodgkin's disease, there is usually more or less absolute or relative polymorphonuclear leucocytosis, but in advanced cases, especially when there is decided splenomegaly, there is often leucopenia. The extreme fibrosis of lymphatic glands found after death in some cases may be partly due to X-ray treatment during life. Owing to limitation of space these remarks by the reviewer must serve instead of more detailed criticism of the author's excellent booklet. The external creasote treatment is new to the reviewer. F. P. W.

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